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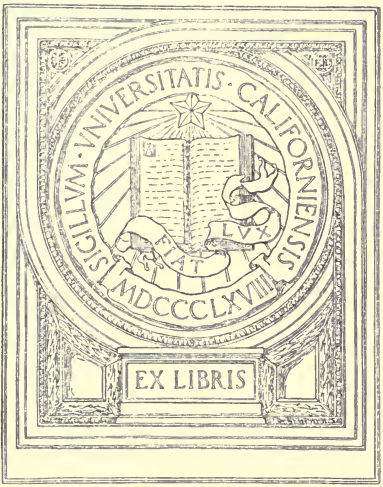
CATALOGUE
OF
WELWITSCH'S AFRICAN PLANTS.
PART II.

UNIVERSITY OF CALIFORNIA
AT LOS ANGELES



CATALOGUE

OF THE

AFRICAN PLANTS

COLLECTED BY

DR. FRIEDRICH WELWITSCH
IN 1853–61.

DICOTYLEDONS, PART II.

COMBRETACEÆ TO RUBIACEÆ.

BY

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LII. COMBRETACEÆ.

Combretaceæ, whether as climbers often with their grand inflorescence, or as moderate-sized trees, constitute one of the greatest ornaments of the tropical landscape, making a splendid show with their variously-coloured leaves and winged fruits; by the abundance of their flowers, especially in the case of the species which have red blossoms, they produce a wonderfully magnificent effect: they mostly bloom in winter. *Combretum flammeum* Welw., a climbing shrub, which is frequent about Sange in Golungo Alto, has its petals and sepals and even its bracts coloured bright red, ultimately turning dark blood-red, and thus presents the appearance of a burning bush. Few species give from dried specimens any adequate idea of the beauty of the plants in a growing state. Some species occur only as herbs or undershrubs, others as trees even to the height of 80 ft., others again either as small shrubs or mighty climbers; some have a very wide distribution, as for instance *C. constrictum* Laws., which occurs on both the western and eastern sides of the African continent, and which in Angola is diffused in different forms in the interior, and is represented in Pungo Andongo by a closely allied species.

Six species of trees or erect shrubs adorn the forests about Pungo Andongo, and of these one with large glossy leaves and clusters of blood-red fruits is conspicuous, inhabiting the forests of the Cuanza valley from Sansamanda to Quisonda, a distance of at least 75 to 80 geographical miles; *Combretum constrictum* Laws., an officinal shrub, occurs very abundantly near Candumba; the scandent species with flaming-red flowers are rarer than in Golungo Alto and Cazengo; but *C. racemosum* P. Beauv. with its silky-glossy leaves and scarlet-red flowers produces a splendid contrast. Several species, which are found in masses in Golungo Alto, occur in Pungo Andongo singly, and so exercise but little effect as a feature in the physiognomy of the vegetation.

Most species show a considerable variation between the leaves of their young shoots and those of the older flower-bearing branches, both in shape and indumentum, so that it is often very difficult to classify forms of the same species which have sprung from the same stock but at different periods or have attained a greater age; frequently even the densest tomentum on the radical shoots becomes obsolete on the flowering shrub. The pubescence, which is often silky or like felt, and which is whitish or greyish on the living plant, assumes on dried specimens a tawny or ferruginous colour, rendering the descriptions taken from herbarium specimens mostly erroneous and occasioning wrong diagnostic characters. For instance, *C. holosericeum* Sond. is described by its author as clothed with tawny hairs, while in nature it shines with a silvery-white pubescence on its leaves and branches, and the wings of its fruit, described as yellowish, are really of a blood-red colour.

The colour of the petals is remarkably constant in the same

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species; Welwitsch never noticed in Angola whitish or yellow petals in the typically red-flowering species, nor red petals in the typically white or yellowish species.

The wood of several species of *Terminalia* and of the arborescent *Combreta* is very valuable and held in high estimation by the colonists, as for instance that of the Múeia and the Gusúsu. The roots and bark of some species are used as yellow and black dyes; and those of others as an astringent in skin diseases and diarrhœa. *T. Catappa* L., which has been long cultivated in the Cape de Verde Islands and in St. Thomas and Prince's islands, is a capital tree for avenues and moreover supplies well-flavoured seeds. *Laguncularia racemosa* Gaertn. f. is well suited for making dams to prevent the washing away of the beach on the sea-shore; it grows almost exclusively and thrives well in salt water, in company with *Avicennia* and *Rhizophora*; in some negro villages the bruised leaves are employed for tanning and dyeing brown fishermen's nets, either alone or mixed with the leaves of *Chrysobalanus Icaco* L. The Mube, *Combretum holosericeum* Sond., supplies the people of Loanda with excellent firewood, and on that account has become rarer and rarer in that neighbourhood. The flowers of most species afford ample food for bees.

1. **TERMINALIA** L.; Benth. & Hook. f. Gen. Pl. i. p. 685 (excl. syn. *Bucida* L.).

1. **T. Catappa** L. Mant. Pl. ii. p. 519 (1771); Welw. Apont. p. 567 sub n. 164; Laws. in Oliv. Fl. Trop. Afr. ii. p. 416; Ficalho, Pl. Uteis, p. 182 (1884).

Buceras Bucida Crantz, Inst. i. p. 133 (1766).

Island of St. Thomas.—Coast region, in the ascent to Fazenda do Monte Caffé; fl. without fr. end of Dec. 1860. Cultivated under the name of "Amendoeira das Westindias," but a native of the East Indies. No. **4293***b* and Coll. Carp. 19.

Cape de Verde Islands.—A handsome tree, about 25 ft. high. Cultivated in S. Iago, in Valle de S. Domingo, in gardens, etc., and called "Amendoeira da India" (the Indian almond tree); fl. and fr. Jan. 1861. No. **4293**. Ripe fr. Jan. 1861. "Amendoeira das Westindias." Coll. Carp. 547.

Welwitsch recommended that this tree should be introduced in Angola. (See Welwitsch, *l.c.*)

2. **T. sericea** Burch. ex DC. Prodr. iii. p. 13 (1828); Laws., *l.c.*

Var. **angolensis**.

T. angolensis Welw. ex Ficalho in Bol. Soc. Georg. Lisb., ser. 2, p. 708 (Feb. 14, 1882), and Pl. Uteis, p. 182 (1884); Elliot in Journ. Linn. Soc. xxx. p. 79 (1894); ? O. Hoffmann in Linnæa xliii. p. 131 (1881).

Ambaca.—A sparingly leafy tree, 15 to 20 ft. high; trunk straight; head widely spreading; leaves thinly coriaceous, evergreen, greenish-glaucous, rather bright, paler beneath; flowers white. In mountainous rocky places near the cave at Puri-Cacarambola, at an elevation of about 3000 feet, not abundant; fl. middle of Oct. 1856. No. **4339**.

PUNGO ANDONGO.—In dry thin open woods near Caghuy ; fl. Nov. 1856, fr. May 1857. No. **4286**. A tree of 12 to 20 ft., occurring throughout Angola, with very hard and durable wood, and known by the name of "Mueia," wonderfully variable as to the indumentum of its branchlets foliage and inflorescence ; flowering branches, petioles, rachis of the racemes, and calyx usually pubescent-hirsute ; petioles not exceeding $\frac{1}{2}$ to $\frac{2}{3}$ in. long, sometimes almost obsolete ; leaves when old mostly more or less glabrate or thinly puberulous, almost always oblong-oblanceolate, always deep-green above, canescent or whitish-glaucous with midrib purplish beneath ; flowers white, arranged in simple racemes shorter than the leaves ; stamens 10 ; drupes $1\frac{1}{4}$ to $1\frac{1}{2}$ in. long, borne on a stipes of $\frac{1}{4}$ to $\frac{1}{2}$ in. long, and surrounded with a rather rigid wing elliptical in outline and more or less emarginate at the apex, thinly tomentellous or pubescent on the surface. Abundant, on rocky hills and at the borders of forests near the fortress ; fl. and fr. Oct. 1856. No. **4340**. A moderate-sized tree with a narrow head, and affording excellent timber ; flowers white. In open rocky woods near Caghuy ; fl. Nov. and Dec. 1856. No. **4341**. An evergreen tree, 15 to 20 ft. high. In the thickets of the fortress near the river Luxillo ; fr. May 1857. No. **4342**.

HUILLA.—A small tree of 8 to 12 ft. ; branches and branchlets sparse, deep-purple, glabrous ; leaves alternate, subsessile, oblanceolate, apiculate, glabrous on both sides, bright-green above, glaucous beneath. In hilly tall-bushy places between Lopollo and Humpata, at 5000 to 5500 feet altitude ; fr. end of May 1860 ; a glabrate form. Nos. **4285** and **4343**. COLL. CARP. 59.

Var. **huillensis**.

Foliage pallid, clothed on both sides with appressed inconspicuous pubescence.

HUILLA.—A small tree, of a grey colour, with pallid head and white flowers. In hilly, bushy, somewhat stony, dry and barren situations between Lopollo and Nene, at an elevation of 5000 ft. ; fl. Dec. 1859, young fr. Feb. 1860. Nos. **4294** and **4338**.

The mueia (pronounced mu-ei-a) has a trunk rarely exceeding 18 in. diameter ; the wood is compact, of tolerably fine grain, yellowish colour and great hardness, and suitable for the construction of various agricultural implements, carts, and domestic utensils. See Welwitsch, Apont. p. 568 under n. 164, and Synopse, p. 18, n. 45.

3. **T. benguellensis** Welw. ms. in Herb., sp. n.

An inelegant shrub, sub-arborescent, 4 to 6 ft. high or occasionally higher, remarkable for the hardness of its wood and rigidity of its ramifications ; branches virgate, subterete, glabrate below, shortly pubescent or felted above, the older ones subspinescent in consequence of the stiff pin-like character of the patent alternate lateral branchlets, which are leafy in a fasciculate manner at the apex ; indumentum pallid ; leaves alternate scattered or mostly crowded at the tips of the branchlets, obovate, rounded and often apiculate or emarginate at the apex, more or less wedge-shaped at the base, thinly coriaceous, deep-green and glabrescent or obsoletely tomentellous above, pallid and felted beneath, entire, 1 to $2\frac{1}{4}$ in. long by $\frac{1}{2}$ to $1\frac{1}{8}$ in. broad ; petiole $\frac{1}{3}$ to $\frac{1}{2}$ in. long, hairy or subglabrate ; inflorescence in the axils of the uppermost leaves ; fruits racemose, bright blood-red, oval-

oblong, glabrate, drupaceous, surrounded by a broad flat purplish wing, $1\frac{3}{4}$ to 2 in. long by $\frac{3}{4}$ to 1 in. broad, emarginate at the apex, somewhat narrowed towards the base; central portion bony, very hard, 1-seeded; fruiting racemes 1 to $2\frac{1}{2}$ in. long, pedicels ranging up to $\frac{1}{4}$ in. long.

BENGUELLA.—In bushy places at the sea coast near the city; fr. June 1859. Nos. **4290** and **4344**.

Var. **ovalis**.

Fruit oval in outline, $1\frac{1}{2}$ to $1\frac{3}{4}$ in. long by 1 to $1\frac{1}{8}$ in. broad, deep blood-red; leaves rather oblanceolate, nearly glabrescent except the veins beneath.

MOSSAMEDES.—In sandy thickets, near the town, at Boca do Rio Bero, on the sea coast; fr. July 1859. Nos. **4291** and **4337**. COLL. CARP. 106 and 548.

HUILLA.—In bushy, hilly, rather dry places between Lopollo and Nene; fl. Dec. 1859, young fr. Feb. 1860 (fr. April). No flowers have been preserved. No. **4292**.

4. **T. brachystemma** Welw. ms. in Herb., sp. n.

A tree, 15 to 20 feet high, glabrous throughout except the very young leaves pedicels bracteoles and part of the flowers, with the habit of an *Anacardium*; head very broad; branches patent; leaves alternate, scattered on the barren shoots, crowded at the extremities of the flowering branches, sessile or at length shortly petiolate, obovate or obovate-elliptical, rounded obtuse or emarginate and abruptly acuminate cuspidate apiculate or mucronate at the apex, gradually attenuated towards the base, deep-green above, whitish-glaucous beneath, $2\frac{1}{2}$ to $6\frac{1}{2}$ in. long by $1\frac{5}{8}$ to $2\frac{3}{8}$ in. broad, entire, thinly coriaceous; venation inconspicuous; flowers polygamo-dioecious, $\frac{1}{10}$ in. diam., on short pubescent pedicels, arranged in spikelike shortly pedunculate racemes 1 to 2 in. long; bracteoles lanceolate, about equalling the pedicels, pubescent outside, deciduous; calyx yellowish-green or whitish, puberulous or glabrescent, 5-cleft; lobes deltoid at the base, with a prolonged tip; stamens shorter than or scarcely exceeding the calyx; ovary pilose; style prolonged, glabrescent; fruit glaucous-purple, glabrate, oval, somewhat compressed, surrounded with a broad wing, emarginate at the apex, somewhat narrowed or nearly rounded at the base, 1 to $1\frac{5}{8}$ in. long by 1 to $1\frac{1}{8}$ in. broad.

HUILLA.—In open woods, in rocky places, at an elevation of 5000 to 5600 ft., between Lopollo and Empalanea; fl. Oct. 1859; fr. May 1860. Nos. **4287** and **4345**. Cf. COLL. CARP. 86.

2. **GUIERA** Juss.; Benth. & Hook. f. Gen. Pl. i. p. 687.

1. **G. senegalensis** Lam. Tabl. Encycl. ii. p. 486, t. 360, fig. sup. (1793); Pers. Syn. Pl. i. p. 470 (1805); Poir. Encycl. Méth. Suppl. ii. p. 861 (1811); Guill. & Perr. Fl. Seneg. p. 282, t. 66, fig. 2 (1833); Laws. in Oliv. Fl. Trop. Afr. ii. p. 418.

G. glandulosa Sm. in Rees, Cycl. vol. xvii. (1811). *Gujera senegalensis* Gmel. Syst. ii. p. 675 (1791).

Mossamedes.—A robust shrub, climbing high and widely, becoming hoary; leaves opposite, densely tomentose beneath and also white-punctate above. Abundant in tall thickets in Mata dos Carpenteiros; without either fl. or fr. July 1859. Nos. **4289** and **4346**.

3. **LAGUNCULARIA** Gærtn. f.; Benth. & Hook. f. Gen. Pl. i. p. 688.

1. **L. racemosa** Gærtn. f. Fruct. iii. p. 209, t. 217, f. 3 (1805); Welw. in Proceed. Linn. Soc. ii. p. 328 (1854); Lawson in Oliv. Fl. Trop. Afr. ii. p. 419.

Loanda.—A shrub standing erect, or a small tree of 5 to 7 ft.; flowers white. Abundant and nearly always in company with *Rhizophora* and *Avicennia*, at the muddy sea-shore, near the city of Loanda; at Zamba grande, frequently inundated by the sea; fl. July 1854. No. **4347**. Abundant also in like company on the island of Loanda, at Cabo Lombo, etc.; fl. from Oct to Dec. 1853.

4. **COMBRETUM** Loefling, Iter, p. 308 (1758); L. Syst. edit. 10, p. 999 (1759); Benth. & Hook. f. Gen. Pl. i. p. 688.

1. **C. Klotzschii** Welw. ex Laws. in Oliv. Fl. Trop. Afr. ii. p. 422, quoad specim. Welw.

Golungo Alto.—A gigantic shrub, climbing high; sarmentose branches 20 to 25 ft. long; leaves thick, not coriaceous, fallen at the time of the flowers; flowering branches often 2½ ft. long, as well as the whole inflorescence, except the petals, glandular-viscid; calyx nerved-striate, pale-greenish, almost yellow-greenish; petals of a deep red-scarlet colour; styles far exceeding the 10 stamens. In the more elevated thickets and on sparingly-leafy trees at the skirts of forests, on the north-east side of the mountains of Serra de Alto Queta; fl. and fr. July 1855. No. **4300**.

2. **C. oxystachyum** Welw. ex Laws., *l.c.*, p. 422.

Bumbo.—A shrub, 3 to 5 ft. high, softly pubescent throughout, sparingly and patently branched; branches sometimes elongate-sarmentose; leaves alternate or opposite; flowers scarlet, arranged in acutely conical spicate racemes 2½ to 3 in. long, terminating the branches and branchlets; calyx-teeth long, acute, gradually acuminate; petals lanceolate, acuminate, rigid, hairy outside; stamens 10; fruit 5- or 4-winged. In rocky tall-bushy places near Quitibe de Cima, at an elevation of 2000 to 2500 ft., sparingly; only one shrub seen in fl. and (very few) fr.; June 1860. No. **4309**.

3. **C. celastroides** Welw. ex Laws., *l.c.*, p. 422.

Huilla.—A much-branched shrub, 4 to 7 ft. high, very rarely arborescent but scarcely scandent, or frequently a bush with a trunk and more or less climbing branches, with the habit of a *Celastrus*; leaves lepidote beneath; flowers yellow, tetramerous; calyx densely lepidote: disk present; fruit densely lepidote. In hilly places amongst tall bushes from Mumpulla up to Lopollo, especially in Morro de Lopollo; fl. bud Oct., fl. Dec. 1859, fr. March 1860; also in rocky places, fr. end of March 1859; and in forests above Lopollo, Dec. 1859. Nos. **4370**, **4389**. Cf. Coll. Carp. 557 (part).

4. **C. grandiflorum** G. Don in Edinb. Phil. Journ. 1824, p. 346; Laws., *l.c.*, p. 423.

C. Afzelianum G. Don, Gen. Syst. ii. p. 666 (1832).

SIERRA LEONE.—A climbing shrub, 4 to 6 ft. high; shoots 6 to 10 ft. long, scandent in all directions or pendulous-nodding; leaves glossy, blackish-green, coriaceous; flowers sanguine-red, brilliant, very handsome. In elevated forests at the cataract of Sugar-loaf Mountain above Freetown; fl. Sept. 1853. No. **4311**.

AMBRIZ.—Sporadic, in rocky thickets alongside streams between Ambriz and Quizembo; fl. Nov. 1853. No. **4310**.

5. **C. constrictum** Laws. in Oliv. Fl. Trop. Afr. ii. p. 423; Ficalho, Pl. Uteis, p. 183 (1884).

LOANDA.—A large shrub, 5 to 7 ft. high, with stems in some cases erect, in others climbing amongst other shrubs or decumbent; leaves deciduous at the flowering season; flowers whitish; anthers brick-red. Abundant in moist thickets between Quicuxe and Mutollo, but rarely flowering: at Quicuxe with leaves and without fl. April and July 1854. Native name "Mafucama-hóje" or "Muhondongolo." No. **4302**.

ICOLO E BENGO.—By thickets in rocky situations near Prata; fl. Sept. 1854. Native name "Muhondongolo." No. **4304**.

LIBONGO.—A small shrub, mostly only 1 to 3 ft. high, rarely attaining 3 to 5 ft., mostly but not always leafless at the time of flowering: branchlets virgate-sarmentose; leaves opposite, membranous but rather fleshy, quickly dropping in the course of drying; calyx-limb glabrescent; petals elongate-spathulate, obtuse, rather shaggy, whitish; stamens 10, with red anthers. In dense thickets at the edges of forests in the more elevated parts of the district, at the banks of the river Lifune: fl. without leaves Sept. 1858. Native name "Muandongolo." No. **4303**.

GOLUNGO ALTO.—A climbing shrub, 3 to 5 ft. high, with sarmentose branches variously curved or elongate-straight; petals of a pale sulphur colour, woolly-ciliate. In rocky thickets near Cambondo and Cabanga Cacalunga, sporadic; fl. and young fr. Oct. 1855, ripe fruit Jan. 1855. Native name "Muhondongôlo" or "Mochondongolo." Nos. **4282** and **4305**. A low scandent shrub; leaves grass-green, pendulous by reason of the weak petioles being always bent and twisted in various ways: odour of the bruised branches and foliage resembling that of *Prunus Padus* L., not noticed in the root, which is recommended by the natives as an excellent remedy in the case of worms (*Ascarides*) in children. In thickets about Sange, sporadic; without either fl. or fr. beginning of June 1855. Native name "Muhondongolo." No. **4306**.

AMBACA.—A sarmentose shrub, 2 to 4 ft. high, with numerous stems, mostly leafless at the time of flowering; leaves membranous but rather rigid; flowers white except the brick-red anthers, decandrous; calyx rather shaggy, with a campanulate limb and 5 teeth; petals elongate-spathulate or lanceolate-spathulate, shaggy, whitish, erect, far exceeding the calyx-limb. Not uncommon but sporadic, in bushy rocky places near Puri-Cacarambola; fl. and also leafy branches Oct. 1856. Used officinally by the natives. This No. is referred in Welwitsch's herbarium, to Lawson's variety β, though the next species, *C. rigidifolium* Welw., better suits Lawson's description. No. **4307**.

A decoction of the root or a tepid infusion of the bark is administered to children suffering from intestinal worms (*Ascarides*); it is usually leafless at the time of flowering. Another form of the native name is "Muandongôlo." The green leaves when rubbed give off the smell of cyanic acid.

6. **C. rigidifolium** Welw. ms. in Herb.

An erect shrub, 3 to 4 ft. high; stem with a few subterete

branches springing from near its base, dark-ashy rather strict and straight and puberulous towards the extremities; leaves mostly ternate, oval, shortly acuminate to an obtuse or apiculate apex, somewhat cordate at the base, minutely white-dotted and glabrous on both faces except the puberulous clearly marked venation, the principal veins of which are impressed on the upper face, sub-glaucescent above, thinly coriaceous, very rigid, 3 to 6 in. long by 1½ to 3 wide; petiole tawny-tomentellous or obsoletely so, ⅛ to ⅙ in. long, thickened towards the base; inflorescence axillary, densely racemose, brown-tomentellous or densely pubescent, about half as long as the leaves; pedicels ranging up to ¼ in. long; flowers white, pentamerous; calyx densely pubescent, almost tomentose, constricted above the ovary, the free portion somewhat funnel-shaped, ⅛ in. long, glabrous inside except dense brush-like hairs at the base, teeth deltoid, short; petals oblanceolate, shaggy, veiny, longer than the calyx-teeth, $\frac{1}{10}$ in. long; stamens 10, unequal, exserted, glabrous, inserted on the calyx-tube at different heights near its middle; style glabrous, exserted rather beyond the filaments.

Pungo Andongo.—In thickets along the margins of Panda forests, near Luxillo, sparingly, only two specimens seen in fl. (and afterwards in vain sought for in fr.), end of Oct. 1856. No. **4308.**

Nearly related to Muandongolo (*C. constrictum* Laws.).

7. **C. racemosum** P. Beauv. Fl. Owar. ii. p. 90 t. 118 (1818); Guill. & Perr. Fl. Senegamb. p. 285, t. 67 (1833); Laws. in Oliv. Fl. Trop. Afr. ii. p. 424.

Golungo Alto.—A divaricately branched shrub, 3 to 4 ft. high, rambling, scarcely scandent; leaves thick but soft, clothed beneath with a whitish tomentum; flowers purple. By secondary thickets between Trombeta and Cambondo, rather rare; fl. 19 Sept. 1854. No. **4299.** A slender sarmentose shrub, much branched from the base, occasionally standing erect; branches very long, sometimes deflexed, sometimes scandent, or twisted and twining, aculeate; prickles strong, recurved, acuminate; adult leaves brightly shining, green, the young leaves whitish-yellow or yellowish-tomentose; flowers atro-purpureous or blood-red purple, subsessile; bracteoles small, narrow, acute; calyx clothed with short shaggy downy hairs, the tube obtusely 4-angled, the limb funnel-shaped or elongate-campanulate, shaggy inside about the insertion of the stamens, naked and with a purple gloss at the base about the insertion of the style, mouth ciliate, 4-toothed, teeth from a broad base abruptly long-acuminate, erect; petals 4, obovate- or ovate-lanceolate, erect, mostly rather acute but occasionally hooded at the apex or folded or rather obtuse or quasi-spathulate, rather fleshy and rigid, glabrous inside, densely shaggy outside, more or less bearded-ciliate on the margin, atro-purpureous or yellow-reddish, much longer than the calyx-teeth; stamens 8, very long, inserted in two rows, exserted, straight, radiately arranged; style glabrous, straight, central, nearly as long as the filaments; fruit smooth, 4-angled, green-reddish. In the drier thin hilly thickets near Bango Aquitamba and Bumba; fl. and young fr. Sept., fl. and ripe fr. on the same branches Oct. 1855. No. **4353.**

Pungo Andongo.—A sarmentose shrub, 4 ft. high; fruit rose-

purple. By the thickets of the fortress, near Luxillo, rather rare ; fr. Feb. 1857. No. **4354**.

8. **C. flammeum** Welw. ms. in Herb.

C. racemosum, var. *flammeum* Welw. ex Laws. in Oliv. Fl. Trop. Afr. ii. p. 425.

Golungo Alto.—An arborescent shrub, very widely and highly but not very highly climbing. Sange, fl. July 1856. No. **4295**. Near Sange, 31 March 1856 ; fl. and fr. on the same plant. No. **4296**. In Molemba (cf. *Ficus*) groves at Sange ; ripe fr. Nov. 1854. No. **4297**. By side of and on the road from Cambondo to Trombeta ; in the rainy season, Sept. 1854, without fl. or fr. No. **4298**. A very beautiful prickly shrub, climbing extensively but not to a great height, glandular-downy when young ; leaves not coriaceous, opposite or occasionally ternate, pellucid-punctate, ciliate on the margin with hyaline hairs ; petioles in old age after the fall of the blades changed into turned-back prickles ; the floral leaves, bracts, pedicels, flowers, and the whole inflorescence carmine, flowers very handsome, tetramerous, nearly sessile, appearing principally in the middle of winter and then often a plant of this shrub covers fences for a distance of 18 to 30 ft. and makes it blaze as if on fire, afterwards flowering in Nov. and Dec. ; calyx glabrous except the tetragonal tube, which is rather shaggy on the angles, limb elongate-campanulate, viscid inside, teeth from a very broad base acute ; petals oblong, slightly attenuated but scarcely acute at the apex, densely downy outside, ciliate at the margin ; stamens far exserted ; style equalling the stamens : fruit smooth, 4-winged, apiculate but not emarginate at the apex, wholly carmine. In thickets at the borders of the forest nearly throughout the district. fl. July and August 1855 and 1856 ; in the Molemba groves, at the end of Oct. 1855, fr. No. **4351**. A widely climbing shrub, very extensively sarmentose ; flowers and floral leaves bright blood-red. In secondary thickets after cultivation, in the garden of the residency, fl. Oct. 1854. Apparently this species. No. **4352**.

Ambaca.—A shrub sometimes erect, sometimes sarmentose-scandent; fruit rose-purple. In neglected roadways ; fr. Oct. 1856. Apparently this species. No. **4355**.

9. **C. paniculatum** Vent. Choix Pl. sub n. 58 (1803); Laws. in Oliv. Fl. Trop. Afr. ii. p. 425.

Golungo Alto.—In thickets between Bango and Sange, fr. May 1856 ; Cungulungulo, fl. No. **4284**. A little shrub, 3 to 4 ft. high, standing erect ; Delamboa river, fl. end of August 1856. No. **4333**. A leafless climbing shrub ; Bango road near Quilombo, fl. July 1856. No. **4334**. Ponte de Luiz Simões ; fl. and fr. August 1855. No. **4336**. A tall-climbing shrub, in the young state usually standing erect and remaining so during 2 to 4 years ; leaves coriaceous, thick, brittle, very glossy on the upper-side, deciduous just at the time of flowering ; calyx 4-toothed, wholly yellowish-green, clothed with a loose tomentum, teeth deltoid ovate acuminate ; petals 4, short, ovate, more or less concave, delicately ciliolate at the apex and on the upper margin, deep-scarlet ; stamens 8, partly much paler than the calyx, inflected in the bud, far exserted in the full flower ; style purplish, exceeding the stamens. In thickets and also in dense primitive forests, climbing on the tallest trees ; Ponte de Luiz Simões, early fl. August 1858. No. **4359**. A robust shrub ; stem often 3 in. in diameter at the base and more, 50 to 60 ft. long or even more, reaching the tops of the

tallest trees, and there with its innumerable flowers decking the tops with a scarlet cloak. In the elevated forests of Cungulungulo in Sobato Calanga, etc., flowering throughout the year; fl. July 1855. No. **4360**. Leaves coriaceous and glossy, not opaque nor herbaceous; flowers carmine. On the way to Ambaca from Ponte de Luiz Simões, fl. June 1855; between Sange and Ponte de Luiz Simões, fl. end of July. No. **4361**. A tall-climbing shrub, with bright-scarlet flowers. By thickets between Sange and Ponte de Luiz Simões; fl. end of July 1855. No. **4362**. A shrub climbing to a great height, spiny in old age; flowers of a fiery-red colour, octandrous; leaves coriaceous, very glossy. Abundant in primitive forests, and standing erect in secondary thickets near Sange; Quibolo, fl. July 1856; Delamboa, fl. August 1856. No. **4366**. A stout shrub, climbing high, with scarlet flowers. In thickets between Bango and Sange; fr. May 1856. No. **4367**.

Cazengo.—A climbing arborescent shrub. Mata de Cabondo; fl. June 1855. No. **4363**.

Zenza do Golungo.—Leaves coriaceous, very shining, ovate-elliptical or occasionally nearly round-ovate; flowers scarlet. In thickets from Quicanda to Tanderaxique; fl. Sept. 1854. No. **4364**. A shrub climbing high and widely, nearly leafless at the time of flowering, the lowest branches furnished with flower-buds and leaves almost all destroyed by insects, the branches in the middle of the climbing stem in full flower, while of the lateral branchlets some already bear fruits and others have foliage only, all on the same individual plant at the same time; leaves varying in consistency to an extraordinary degree; flowers bright-scarlet; stamens 8; fruits remarkable for their silvery-golden lustre. On bushy slopes of the Montes de Mongôlo; fl. and unripe fr. Sept. 1854. No. **4358**.

The following No. is perhaps a form of this species:—

Golungo Alto.—A very glossy-green, prickly shrub, extensively climbing by tall thickets; without fl. or fr. Nov. 1855.—Zenza do Golungo.—Flowers scarlet; Bango road, May 1856. No. **4368**.

10. **C. virgatum** Welw. ex Laws. in Oliv. Fl. Trop. Afr. ii. p. 425.

Pungo Andongo.—A virgate-sarmentose shrub, 5 to 7 feet high, clothed on most parts with whitish silky-shaggy hairs; stems numerous, erect-spreading, sparingly branched; leaves silky-tomentose, even the adult ones velvety-tomentose beneath, but the tomentum cottony or more cottony than on the young leaves which are densely tomentose and remarkable for a coppery-tawny gloss; flowers often on leafless branches, brilliant vermilion, the most brilliant of all species seen by Welwitsch in tropical Africa, very densely clustered, tetramerous; calyx-limb campanulate, teeth deltoid abruptly acuminate bearded at the apex with bundles of rather rigid hairs erect; petals scarlet, broad, suborbicular, very obtuse, scarcely clawed, but little or scarcely longer than the calyx-teeth; stamens 8, tolerably robust, moderately exserted, scarlet; style straight, shorter than the stamens; bracteoles narrow, acute, equalling or a little longer than the ovary, caducous. In thickets at the banks of the river Cuanza, sporadic; fl. April 1857. No. **4357**.

11. **C. virgultosum** Welw. ms. in Herb.

A shrub, 5 to 8 feet high; stems numerous, long, virgate-sarmentose, erect, subterete, softly whitish-silky (turning reddish-brown in drying) when young, obsoletely so afterwards; leaves

opposite or sub-opposite, often ternate, upper ones sometimes alternate, elliptical, narrowly acuminate at the apex, but little attenuated at the base, unequal especially the lower ones at the base, rigidly and thinly coriaceous, deep-green above, paler beneath, 2½ to 5 in. long by ½ to 2 in. broad, those of the barren branches softly whitish-silky (turning reddish-brown in drying), those of the flowering branches more or less smooth and glabrescent; petiole rather longer than usual in the genus, ranging up to 1 in. or more; flowers tetramerous, sessile or subsessile, crowded in dense clusters arranged in axillary and terminal spikes forming oblong or pyramidal more or less leafy panicles, scarlet or blood-red, brilliant; bracteoles minute, narrow, shorter than the ovary, quickly caducous; calyx ⅛ to ⅕ in. long; calyx-limb elongate-campanulate, silky-pubescent outside, pubescent inside; teeth from a deltoid base acute and bearded at the apex; petals very broadly ovate or suborbicular, always but very little attenuated or apiculate at the apex, shortly exceeding the calyx-teeth, overlapping on the margins, glabrous or nearly so; stamens 8, moderately exserted, scarlet like the petals; style rather firm, erect, shorter than the filaments.

Pungo Andongo. On a red-clay soil in the thickets of Cabanga, sparingly; fl. Jan. 1857. No. **4301**. In bushy places on rich ferruginous clay at the borders of primitive forests near Quibanga, rather rare; fl. Jan. and Feb. 1857. No. **4365**.

This species is nearly related to *C. virgatum* Welw., from which it differs by the oblong calyx, smaller bracteoles, less permanent tomentum on the foliage, etc.

12. **C. elæagnoides** Klotzsch in Peters, Mossamb. Bot. p. 73 (1862); Laws. in Oliv. Fl. Trop. Afr. ii. p. 426.

Mossamedes.—A bush or small tree 8 to 12 rarely 15 feet high, with the habit and clothing of an *Elæagnus*; stem much branched from the base; branches divaricate, spinescent when old; wood excellent, very hard, durable, tenacious; branchlets compressed, many abortive and passing into elongated straight spines, the younger ones as well as the lower face of the leaves and young parts clothed with discoid ferruginous or at first silvery scales after the fashion of *Elæagnus*. In shrubby sandy places on the right bank of the estuary of the river Bero (Garganta do Rio Bero) at Boca do Rio, 9 or 10 geographical miles from the ocean, amongst tall bushes, sporadic; leafy branches without either fl. or fr., July and 10 August 1859. Nos. **4283**, **4387**.

In the absence of flower and fruit it is impossible absolutely to confirm this determination.

13. **C. truncatum** Welw. ex Laws. in Oliv. Fl. Trop. Afr. ii. p. 427; non Engler, quod *C. Oliverianum* Engl.

Benguella.—A tree of moderate size, with a spreading broad leafy head; leaves rounded, obtuse, scaly on both faces; fruit proportionately rather small, scaly all over, truncate at the base; seed hexagonal, angles obtuse but fairly prominent. In wooded sandy maritime situations between the city of Benguella and the river Catumbella; fr. June 1859. No. **4372**.

14. **C. lepidotum** A. Rich. Fl. Abyss. i. p. 268 (1847); Laws. in Oliv. Fl. Trop. Afr. ii. p. 427; Ficalho, Pl. Uteis, p. 183 (1884); non Presl (*C. squamosum* Roxb.).

C. Richardianum Van Heurch & Müll. Arg. in Van Heurch, Observ. Bot. fasc. ii. p. 234 (10 Sept. 1871).

Golungo Alto.—A much-branched shrub, 5 to 6 feet high, sometimes almost climbing; leaves not pellucid-punctate; flowers yellow-whitish. Not common, by thickets near the banks of the rivulet Quiposa (or Quiapose), not far from Canguerasange; fl. and old fr. beginning of Nov. 1854. No. **4318**. A small tree; at the banks of the river Cuango, along the base of Serra de Alto Queta, fl. April 1856. No. **4318***b*. A tree 25 to 30 feet high; trunk straight, 18 inches in diameter at the base; crown widely spreading; branches patent. On the drier slopes of Sobato de Mussengue, near Menha-lula; fr. May 1855. A form with narrower leaves. No. **4315**. A tree usually of moderate size, 25 to 30 feet high, somewhat resembling in foliage and flowers a tall *Salix caprea* L., occasionally a handsome lofty tree of 50 to 80 feet and then after *C. dipterum* Welw. the largest of the family in Angola, flowering without leaves at the beginning of spring, glistening like mother-of-pearl; leaves coriaceous; flowers whitish-yellowish. On slopes of the mountains of Serra de Alto Queta, in forests less densely wooded and along streams near Sange, Menha-lula, etc.; fl. beginning of Sept. 1855; fr. end of June and July 1855-56; sporadic. Native name in Bango "Mucage"; it is also called the tree of the worms, on account of its being often lined with grubs of a large and beautiful *Buprestis*. No. **4312**.

Zenza do Golungo.—A tree, 12 to 15 feet high, rarely higher, almost resembling in habit *Amygdalus Persica* L. or when in flower a species of *Salix*; leaves deciduous at the time of flowering, coriaceous when adult; flowers yellowish. Near Montes de Mongôlo (whence Bengo negroes brought fruiting specimens, and where it forms small thickets) and vicinity towards the river Chixe, in company with Celastrineæ forming small bright woods; fl. Sept. 1857. No. **4317**. Montes de Mongôlo; fl. Sept. 1854. No. **4281** (as to fl. specimen).

Ambaca.—A tall tree, 50 to 80 feet high; leaves deciduous. In hilly situations along the banks of the river Caringa, at an elevation of 3000 feet, sporadic and solitary where the primitive forest had been destroyed; ripe fr. June 1855. No. **4316**. River Caringa. No. **4281** (as to fr. specimen).

Bumbo.—A handsome tree; trunk sometimes 18 to 30 inches in diameter; timber highly valued by the Portuguese colonists, who call it Carvalho (oak). In the more open forests along the base of Serra da Xella, not uncommon; branches without fl. Oct. 1859. Native name "Munhangue" or "Munhandge." No. **4313**.

Huilla.—A handsome tree, 20 to 30 feet high, with spreading umbrageous usually broadly-ovoid head; flowers yellowish or in bud purple. In the forest near Mumpulla, where under its shade Welwitsch pitched his tent, and again about Humpata as far as Nene, frequent; fl. and few fr. Oct. 1859. Nos. **4314, 4388**.

Var. **melanostictum** (Welw.).

A small tree of 10 to 15 feet (probably a young one); trunk straight, 9 inches in circumference; head spreading widely; the older branchlets densely scattered with small black points; leaves, even the adult ones, ferruginous-shaggy and densely lepidote

beneath with whitish scales, beset above with whitish conical papillæ; fruit yellow-dusky.

HUILLA.—In the more open forests, consisting for the most part of *Parinari* and of various genera of Cæsalpineæ, between Catumba and Hay; at Monino, fl. Oct. 1859; fr. April 1860. No. **4376.**

Welwitsch noticed in several fruits that when very ripe and dry they split, not only at the apex but down nearly to the base, into four valves, and then the seeds fall out freely.

15. **C. angolense** Welw. ex Laws. in Oliv. Fl. Trop. Afr. ii. p. 428.

GOLUNGO ALTO.—Flowers hermaphrodite, whitish, turning into a pale-sulphur colour; calyx-limb funnel-shaped, 4-toothed; petals 4, broadly ovate-rotundate or almost orbicular, wedge-shaped at the base, glandular-ciliate or delicately fimbriate-dentate on the margin, white; stamens 8 or exceptionally 7 or 6, exserted; anthers reddish; fruits always very densely crowded in little heads, mostly greenish-red or quite red, rather viscid, very shortly stipitate, emarginate at the apex, apiculate in the obtuse emargination, broadly 4-winged (in one instance 7-winged). By thickets along palm-groves, Arimo do Mariano, sporadic, end of May 1855; in thickets by the river Cuango near Sange, beginning of June 1855; Bango road and at Cacarambola May 1856; Sange fl. 7 Sept. 1856. No. **4320.** A subscandent shrub, 3 to 5 feet high, with whitish flowers. At the skirts of the drier thickets in Sobato de Mussengue, fl. end of May 1855; in the forests of the same, in late fr. Feb. 1855. No. **4321.** A climbing shrub; in thickets near Bango, fl. bud, July 1855. No. **4322.**

CAZENGO.—A very widely climbing shrub; flowering branchlets ascending and then pendulous; flowers whitish. In the primitive forests between Dalatando and Cambondo; fl. and fr. June 1855. No. **4323.** A climbing or sarmentose shrub as tall as a man; stem 3 to 4 feet high; the whole plant hoary and clothed with an ashy-velvety tomentum; stamens 8; fruit 4-winged. In secondary thickets at the base of the mountains of Muxaulo, sparingly; fl. and fr. June 1855. No. **4319.**

No. **4335**, without locality, in fl. and fr., appears to belong to this species.

16. **C. laxiflorum** Welw. ex Laws. in Oliv. Fl. Trop. Afr. ii. p. 428.

PUNGO ANDONGO.—A handsome tree of moderate size, 25 to 35 feet high; head ovoid, widely spreading; branches and branchlets spreading; wood whitish, very hard, almost as in Gusuzo (*C. dipterum* Welw.); leaves pellucid-punctate, densely lepidote beneath, as also the calyx with conspicuous branny scales; flowers yellowish or straw-coloured, whitish in bud; stamens 8; ovary 2-ovuled; style central, cylindrical, equally thick from the base to the apex; disk 4-lobed; lobes obtusely emarginate at the apex. In forests on a rich ferruginous clay near Quibanga, sporadic, fl. Jan. 1857; Pedras de Guinga, April 1857; in thickets and small woods by the river Luxillo near the bridge, in scarcely open fl. Jan. 1857, fr. end of April 1857. No. **4384.**

17. **C. rubiginosum** Welw. ex Laws. in Oliv. Fl. Trop. Afr. ii. p. 428.

PUNGO ANDONGO.—A tree, 20 to 25 ft. high; branches erect-patent; leaves very glossy, lepidote beneath; fruit ruddy, densely clothed with red scales. In forests about Pedras de Guinga, up to an elevation of 4000 ft; fr. Jan. 1857. No. **4369.**

18. **C. anisopterum** Welw. ex Laws. in Oliv. Fl. Trop. Afr. ii. p. 429.

HUILLA.—A small bushy tree, 6 to 9 ft. high, with a densely intricate head; ultimate branchlets more or less sarmentose, subscandent; flowers tetramerous, racemose-capitate, yellowish, but little scented, those in the lower part of the raceme male (sterile?) with the tube of the calyx quite filiform, those in the upper part fertile with the inferior portion of the calyx acutely 3- or 4-winged; calyx-limb of all the flowers cyathiform, obscurely and shortly 4-toothed or sometimes almost truncate without teeth; petals yellow, obovate, very shortly clawed; the 4 lower filaments inserted beneath the disc, which is rather thick and pilose around the base of the style. In the more elevated densely bushy or wooded rocky parts of Morro de Lopollo; fl. Nov. and beginning of Dec. 1859; fr. Feb. to end of March 1860. No. **4374**. Cf. COLL. CARP. 557 (part).

19. **C. dipterum** Welw. ex Laws. in Oliv. Fl. Trop. Afr. ii. p. 429; Ficalho, Pl. Uteis, p. 183 (1884).

GOLUNGO ALTO.—An immense tree; trunk 24 to 30 in. in diam. and in rare cases reaching 42 in.; wood very good, whitish, hard, durable; flowers white, pleasantly aromatic. In forests from Sange to the banks of the river Luinha, not uncommon; fl. March 1855. Native name "Gozûso." No. **4380**. A tall tree with a Myrtaceous habit, densely leafy, but in the flowering state almost entirely leafless and in the fruiting state resembling an elm; wood especially hard and durable; flowers white, agreeably fragrant. At the banks of the river Delamboa in Sobato de Bumba, sporadic, fl. March, fr. April 1855; and in forests between Cambondo and Trombeta and the river Luinha, abundant, fl. March 1855. Native name "Gususso." No. **4381**. A shrub or perhaps in the primitive forests a tree, much branched; branches and branchlets spreading; leaves thinly coriaceous; flowers white. In secondary thickets amongst the mountains of Serra de Queta, sparingly in fl. 19 March 1856. No. **4382**.

A small elegant tree; habit Myrtaceous or Combretaceous. Mountains of Alto Queta; fr. only, middle of Dec. 1854. Fruits larger than the type, $\frac{3}{4}$ to $\frac{7}{8}$ in. long, probably the same species. COLL. CARP. 558.

CAZENGO.—A tree, 25 to 40 ft. high, apparently evergreen; wood hard, highly esteemed. In forests on both sides of the river Luinha; fr. 3- and 2-winged in the same head; in leaf 26 Dec. 1854. Native name "Gusûsu." No. **4383**.

20. **C. tinctorum** Welw. ex Laws. in Oliv. Fl. Trop. Afr. ii. p. 430; Ficalho, Pl. Uteis, p. 183 (1884) (*tinctorium*).

C. Kirkii, var., Laws., *l.c.*

PUNGO ANDONGO.—A tree, 15 to 30 ft. high, sparingly branched, with a lax head and almost the habit of *C. lepidotum* A. Rich.; root and occasionally the branches used to dye cloth and other fabrics black; leaves (including a petiole of $\frac{1}{4}$ to $\frac{5}{12}$ in.) 3 to 5 in. long by $1\frac{1}{2}$ to 2 in. broad, sparingly lepidote; fruiting peduncles $1\frac{1}{2}$ to $1\frac{3}{4}$ in. long; fruit $1\frac{3}{4}$ to 2 in. long, 1 to $1\frac{1}{4}$ in. broad, 4- or rarely 5-winged, moderately rounded-emarginate at both ends, yellow-greenish or greenish even when ripe or yellowish or turning quite yellow, lepidote, producing a yellow dye. In forests about the base of Serra de Pedras de Guinga, at an elevation of 4000 ft., sporadic; not quite ripe fr. March 1857. No. **4373**. Native name "Lunga-lasóge."

The following No., without either flower or fruit, resembles in foliage this species :—

Golungo Alto.—A tree-like shrub, as tall as a man. Between Cambondo and Trombeta, Sept. 1857. No. **4386**.

21. **C. paradoxum** Welw. ex Laws. in Oliv. Fl. Trop. Afr. ii. p. 430.

Golungo Alto.—A robust shrub, very widely climbing ; fruiting branchlets nodding or pendulous ; leaves evergreen, the younger ones herbaceous, the adult ones moderately coriaceous, yellow-green above, more obscurely green below, pellucid-punctate, the fresh ones turning yellowish in drying ; flowers tetramerous ; pedicels bearing a small lepidote-tomentellous deciduous bracteole ; calyx obtusely 4-ribbed on the inferior part, constricted above the ovary, shaggy inside, quickly expanding into a shortly campanulate almost quadrangular cup, quasi 4-gibbous downwards, 4-lobed, limb inflected ; petals 4, obovate, from whitish turning yellowish, a little longer than the calyx-teeth ; stamens usually 8, 4 of which are higher than the others, occasionally only 4 and then opposite the petals ; anthers pale yellow ; disk rather thick, ample, orbicular, nearly glabrous or thinly pubescent, covering the inner face of the calyx-tube ; style short, elongate-conical, rather thick ; stigma rather small ; ovary 1-celled, 2- rarely 3- or very rarely 4-ovuled ; ovules pendulous ; funicles (if more than two ovules) unequal ; fruit velvety. In primitive forests at the cataracts, near Fonte Capopa behind Sange, sporadic ; fl. and fr. July and August 1855 and 1856. No. **4385**. A small tree ; branches scandent ; leaves various in shape ; flowers racemose-paniculate ; panicles nodding ; calyx depresso-quadrangular ; stamens 4. At Capopa ; fr. July to Sept. Coll. Carp. 554. An arborescent shrub, subscandent, with long sarmentose branches ; calyx quadrate, saccate ; stamens 4. In the Capopa forests ; fl. and fr. August 1855. Coll. Carp. 555.

22. **C. holosericeum** Sond. in Linnæa xxiii. p. 44 (1850) ; Laws. in Oliv. Fl. Trop. Afr. ii. p. 430 ; Ficalho, Pl. Uteis, p. 183 (1884).

C. psidioides Welw. in Ann. Conselho Ultramar. Lisb., May 1856, p. 249, n. 108.

Loanda.—In coast situations a fairly elegant tree-like shrub with a spreading head and the habit quite like a species of *Psidium*, 5 to 8 ft. high, or in the interior a copiously leafy tree of 15 to 25 ft. ; branches numerous, spreading ; branchlets and foliage clothed with a very soft white-silky indumentum ; leaves obtuse, coriaceous, rigid ; fruit brilliantly or luridly blood-red and lepidote-punctate, 4-winged, racemose. It affords excellent firewood, and is called by the negroes "Mūbĕ." In rocky bushy places near Quicuxe and between it and Mutollo, rather rare, fr. May and July 1854 ; in sandy and stony thickets in the same vicinity, fr. 23 July 1857 ; at Bemposta, fr. 18 May 1859. No. **4378**. Coll. Carp. 549. A small tree of 7 to 9 ft., with the habit of *Psidium* ; trunk terminating with a broad head, unbranched below ; leaves large, obovate-elliptical, tomentose, in thickets in the south-east part of the district, near Quicuxe ; fr. July 1854. Coll. Carp. 550.

This small tree constitutes, together with some Acacias and Burseraceæ, the principal parts of the thin sandy forests in the interior of the districts of Loanda and Calumba, and furnishes the chief part of the firewood used in Loanda ; the wood is also used for the building of the huts, etc.

Pungo Andongo.—A beautiful tree, 20 to 25 ft. high, with a broad spreading head ; branchlets purple ; leaves large, coriaceous, rigid,

obcordate, mucronate, beneath white-punctate especially along the veins, and with raised reticulation; fruit brilliantly blood-red or purplish, obtuse at the base, emarginate at the apex, scattered on the body and wings with atro-purpureous dots. In sandy wooded places along the banks of the river Cuanza, near Sansamanda; fr. Feb. 1857. Nos. **4377**, and (without notes or locality) **4288**.

HUILLA.—A tree of 10 to 15 ft., very rarely reaching 20 ft., with the habit of a *Psidium*; trunk bare at the base; head widely spreading, with a grey hue; flowers turning yellow, atro-purpureous in bud; filaments blood-red. In open sandy forests near Lopollo, in company with species of *Protea* and *Acacia*, abundant; fl. Oct. 1859; without fl. Dec. 1859; fr. Feb. and April 1860. No. **4379**.

23. **C. polystictum** Welw. ms. in Herb.

Cf. *Combretum* (sp. n.), Welw. in Ann. Conselho Ultramar. Lisb., May 1856, p. 250, n. 113.

A closely branched erect or scandent shrub or a small tree; branches terete, glabrate or nearly so; branchlets slender, puberulous with short sub-fulvous hairs; leaves opposite, elliptic-oblong, more or less acuminate at the apex, usually rounded or subcordate at the base, thinly coriaceous or almost papery, puberulous along the nerves or glabrate, 2 to 4 in. long by $\frac{2}{3}$ to $1\frac{1}{2}$ in. broad, dark-green above, paler and closely scattered with small pallid scales beneath; petiole puberulous, $\frac{1}{8}$ to $\frac{1}{4}$ in. long, rather slender; inflorescence cymose, axillary, lateral and terminal, sometimes forming terminal panicles 6 to 9 in. long; ultimate pedicels short in flower, scaly; calyx-limb campanulate, $\frac{1}{8}$ in. long, scaly outside, hairy inside especially over the lower part, shortly 4-cleft; lobes deltoid; petals 4, broadly obovate or suborbicular, about twice as long as the calyx-lobes; stamens 8, exceeding the calyx-limb by about its length; fruit 4-winged, $\frac{2}{5}$ to $\frac{7}{8}$ in. long, $\frac{2}{3}$ to 1 in. broad, more or less densely scattered with small scales.

LOANDA.—A small shrub, sometimes 2 to 3 ft. high, sometimes 5 to 6 ft. In thickets about the city of Loanda and Cacuaco; fl. April to June 1854. No. **4324**. A shrub of 3 to 5 ft., the upgrowth from a cut-down tree of 15 ft., usually very much branched in a cæspitose manner from the base; leaves thinly coriaceous, rather rigid, dark-green above, paler beneath, somewhat wavy on the margin; flowers tetramerous, small; petals very polymorphous, whitish-yellowish. In dry hilly rocky thickets near Imbondeiro dos Lobos and close to Loanda, sporadic; fl. end of April 1854; fr. June 1858 and July 1854. No. **4325**. A shrub, 3 to 4 ft. high, occasionally subsarmentose, erect, much branched. On bushy slopes near Penedo; fr. July 1854. COLL. CARP. 553.

GOLUNGO ALTO.—In the thickets of the lower Queta and in Mata do Mariano, fl. Oct. 1855; Capopa, fr. Aug. 1856. No. **4279**. A tree 12 to 20 ft. high, with the habit of *Amygdalus Persica* L., not yet climbing; branches spreading, virgate; branchlets somewhat nodding; leaves caducous at the time of flowering, coriaceous, glandular-punctate, wavy; flowers tetramerous, densely lepidote-scaly in bud; petals spathulate, pale yellow, quickly very pale; stamens 8; fruit rigid, 4-winged, wings coarsely crenate or subcrenate, wavy. In bushy places at the borders of forests at the base of the mountains of lower Queta,

rather rare ; foliage with flower-bud July 1855 ; without leaves with flower-bud Sept. 1855 ; fl. beginning of Oct. 1855 ; fl. 8 Sept. 1856; Capopa, fr. August 1856. No. **4328**. A shrub of 3 to 4 ft., perhaps later forming a tree, very much branched from the base ; leaves dark-green above, much paler beneath, attracting attention from a long distance ; cotyledons corrugated, not convolute. On mountainous declivities covered with species of *Andropogon* among the mountains of Alto Queta ; fr. end of May 1855. No. **4331**. Scandent ; trunk thick, twining ; wood hard as iron ; leaves punctate between the very delicate veinlets ; N-delle, fr. May 1856. No. **4326**. An erect, much branched little shrub, 2 to 3 ft. high ; leaves paler beneath. On grassy slopes amongst the mountains of Serra de Alto Queta, in company with Molungo (*Erythrina suberifera* Welw.) and Cateta bulla (*Tinnea antiscorbutica* Welw.) ; fr. May 1855. Coll. Carp. 551.

Zenza do Golungo.—A shrub, 6 ft. high. On the drier hills between Calumguembo and Montes de Mongolo ; fr. Sept. 1854. No. **4327**.

Ambaca.—A shrub, 4 to 6 ft. high, very rarely a small tree, always very much branched ; leaves deciduous at the time of flowering ; flowers white. In level thickets between N-gombe and Puri-Cacar-ambôla ; fl. Oct. 1856. No. **4332**.

Var. **undulatum**.

All the leaves closely wavy on the margin.

Loanda.—A little shrub, 2 to 3 ft. high, climbing amongst low bushes ; branches slender and very numerous. On the slopes of Alto das Cruzes ; without fl. June 1854. No. **4329**.

The following two Nos. differ by their leaves having a greatly prolonged acumen at the apex in a similar way to that which characterises *C. Hartmannianum* Schweinf. Fl. Æthiop. (i.) p. 24 t. 3a (1867) ; Laws., *l.c.*, p. 431 :—

Golungo Alto.—A robust arborescent shrub ; trunk 2 to 3 in. in diameter at the base, but twining ; branches elongated, flexuous, climbing high and widely amongst bushes ; leaves thinly coriaceous, shining above, canescent beneath, strongly wavy on the margin, caducous at the time of flowering ; flowers, so far as can be judged from their withered remains, whitish. At the borders of primitive forests between N-delle and Cambondo, young fr. Jan., ripe fr, March 1856 ; in primitive forests near N-delle, young fr. Feb., ripe fr. April 1856. No. **4330**. Scandent ; trunk 3 in. in diameter ; wood hard as iron. At the borders of forests near N-delle and between it and Cambondo ; young fr. Jan. and Feb. 1856. No. **4280**.

24. **C. Zeyheri** Sond. in Linnæa xxiii. p. 46 (1850) ; and in Harv. & Sond. Fl. Cap. ii. p. 511 (1862) ; Harv. Thes. Cap. i. p. 48 t. 75 (1860).

Huilla.—A small tree, 8 to 15 ft. high, with golden-yellow fruit. In little woods near the Monino, in company with Proteaceæ ; fr. May 1860. No. **4371**.

25. **C. argyrotrichum** Welw. ex Laws. in Oliv., *l.c.*, ii. p. 432.

Huilla.—An erect undershrub, 1 to 2½ ft. high, almost in every part softly pubescent or white-silky, remarkably resembling in habit some Rubiaceæ ; rhizome thick, woody, giving off numerous stems ; flowering plant conspicuously shining white with silky pilose hairs,

which at length in drying turn dusky ; flowers tetramerous, yellowish ; style thickened in a clavate manner towards the apex ; fruit 4- (3- to 5-) winged, always ruddy or purple. In somewhat rocky thickets at the borders of primitive forests near Mumpulla, sporadic ; fl. Oct. 1859; towards Lopollo, fr. March and April 1860. No. **4375**.

26. **C. platypetalum** Welw. ex Laws. in Fl. Trop. Afr. ii. p. 433. *C. Oatesii* Rolfe in Oates, Matabele Land, ed. 2 p. 399, t. 10 (1889).

Huilla.—A little shrub, 6 to 18 in. high, branched from the base ; primary stem abbreviated ; lateral branches decumbent or oblique, leafy ; the younger branches silky with whitish hairs ; indumentum of the whole plant whitish-silky in the living state, not tawny nor dusky as afterwards in the herbarium ; leaves mostly alternate, coriaceous, oblong-elliptical or obovate-elliptical, broadly subcordate at the base ; bracts small, lanceolate, acute, shorter than the ovary ; calyx elongate-campanulate, adpressedly pilose below, shortly 4-toothed, teeth from a broad base, abruptly subulate, cinnabar-red ; petals obovate, sub-orbicular, sessile, with a broad base, concave, very obtuse or truncate or subemarginate at the apex, very broad for the genus, margins laterally overlapping, many times broader and longer than the calyx-teeth, cinnabar-red (brightly so even after two years in the herbarium) ; stamens 8, cinnabar-red ; filaments glabrous, rather thicker than usual in the genus ; style straight, cylindrical, glabrous, shorter than the stamens ; stigma terminal, sub-truncate ; ovary very shortly stalked, narrowly ellipsoidal, densely pubescent ; fruit 4-winged, $1\frac{7}{12}$ in. long by $1\frac{1}{12}$ in. broad, smooth, scarlet. On shortly-bushy pastures between Mumpulla and Humpata ; fl. and fr. Oct. 1859. No. **4356**.

5. **CAMPYLOCHITON** Welw. ms. in Herb., gen. nov.

Calyx adnate to the ovary and 5-ribbed or 5-furrowed at the base, limb tubular, sub-cylindrical, moderately curved, produced far above the ovary, shortly 5-cleft at the apex, more or less shaggy within, deciduous. Petals 5, oval or ovate-lanceolate, pointed at the apex, shortly clawed at the apex, nearly equal among themselves, veiny, rather exceeding the calyx-lobes and alternating with them, inserted at the top of the calyx-tube. Stamens 10, exserted, inserted on the calyx-tube near its middle or in two rows, the 5 longer filaments adnately decurrent lower down the calyx-tube than the rest ; filaments all filiform, subulate at the apex, following the curvature of the calyx-tube, inflexed in the bud ; anthers cordate-ovate, dorsifixed, introrse, 2-celled, dehiscing longitudinally. Disk fleshy, cup-shaped, investing and adnate to the lower part of the calyx-limb, with a 5-crenate free apex ; the lobes obtuse, like folds or glands fasciculately bearded at the apex and forming a ring below the middle of the calyx-tube. Ovary campanulate, 1-celled ; style filiform, nearly as long as the stamens, somewhat curved, exserted ; stigma sub-truncate or obscurely 5-lobed ; ovules about 4, pendulous from the apex of the ovary-cell. Fruit with a central elongated-ellipsoidal membranous-fibrous subspongy body and 5 or rarely only 4 broad membranous or papery rigid semicircular coloured wings ; seed solitary, elongated ; embryo straight ; cotyledons

rather thick, fleshy, convex-plane or sub-semicylindrical, narrowly oblong, obtuse, with a few longitudinal furrows on the convex back, smooth on the flat inner face: radicle very short, straight, obtusely conical; plumule inconspicuous. Erect or scandent robust shrubs, with opposite or rarely alternate leaves, large spicate-racemose bracteate flowers, and rather large winged fruits.

Cacoucia Benth. & Hook f. Gen. Pl. i. p. 688, *pro parte;* Laws. in Oliv. Fl. Trop. Afr. ii. p. 433, *pro parte;* non Aubl., nec Walp.

1. **C. platypterus** Hiern.

Cacoucia platyptera Welw. Sert. Angol. p. 24 (1869); Hemsley in Hook. Ic. Pl. t. 2549 (June 1897). *C. villosa* Laws. in Oliv. Fl. Trop. Afr. ii. p. 433, quoad specimen Welwitschianum. *C. paniculata* Laws., *l.c.*, p. 434, quoad specimen Mannianum.

Golungo Alto.—An arborescent shrub, sometimes standing erect (as for instance at Ponte de Felix Simões), in other cases climbing to a great height to the tops of forest trees; stems cylindrical, glabrous; leaves opposite or occasionally sub-alternate, glossy, obscurely green, evergreen; peduncles rachis bracts and flowers silky-tomentellous, in the living state whitish-tomentellous; flowers rather fleshy; bracts at length deciduous; calyx-tube rosy-scarlet, $\frac{3}{4}$ to 1 in. long; glands at the insertion of the filaments yellow, silky-bearded at the apex; anthers yellow; style 1 to $1\frac{1}{4}$ in. long; ovules 4, pendulous to a considerable distance from the apex of the cell of the ovary; fruit brilliantly coloured deep rosy-scarlet throughout, $1\frac{1}{2}$ to $1\frac{1}{2}$ in. long and broad; wings papery, rather rigid. In the tall thickets at the borders of primitive forests among the mountains of Serra de Alto Queta, near Sange; also at Capopa, etc; fl. April and May 1855 and 1856; fr. August and Sept. 1856 and 1857. No. **1752** and Coll. Carp. 556. Sobato Mussengue; fl. end of May 1856. A form with alternate leaves. No. **1752***b*.

The most beautiful member of the family in Angola.

6. **CAMPYLOGYNE** Welw. ex Hemsl. in Hook. Ic. Pl. t. 2550 (June 1897).

1. **C. exannulata** Hemsl., *l.c.*

Cacoucia exannulata O. Hoffm. in Linnæa xliii. p. 132 (1881).

C. bracteata Laws. in Oliv. Fl. Trop. Afr. ii. p. 434, quoad specimen Welwitschianum.

Golungo Alto.—A climbing shrub, spiny at the base or with the petioles at length hooked-spinescent; calyx tubular, curved, superior, 5-furrowed, obtusely 5-ribbed; tube naked inside, without a ring of hairs or glands, herbaceous and green on the lower fifth, the rest more tender and sub-corolline, whitish or of a soiled-rose colour or reddish after flowering; petals 5, ovate or oval, rather obtuse, sessile or very shortly unguiculate, more or less silky-pubescent on both faces, whitish or at length pale-reddish; stamens 10, the 5 longer ones scarcely exceeding the petals; anthers almost orbicular, didymous, red, dorsifixed in the middle, 2-celled, longitudinally dehiscing; ovary obtusely pentagonal, 1-celled, bi-ovulate; ovules pendulous from the apex of the ovary; style scarcely exserted, adhering below (for the lower fifth) to the calyx-tube and then doubly bent in a sigmoid manner, much thickened at the double bend, filiform above, from the middle towards the apex

thickened to the thicker obliquely truncate capitate or depressed-disciform stigma; seed elongate-oblong, pentagonal; testa membranous or rather fleshy; cotyledons obovate-elliptical, broadly plicate, one of them being received in the folds of the other. In forests, Barranco de Pereira; fl. and fr. May 1855. No. **4349**.

Cazengo.—Rather frequent in Mata de Cabondo, June 1855. (No specimen.)

Pungo Andongo.—A sarmentose shrub with whitish to slightly reddish flowers. In thickets within the lines of fortifications; fl. May 1857. No. **4350**.

7. **QUISQUALIS** Rumpf, L.; Benth. & Hook. f. Gen. Pl. i. p. 689.

1. **Q. falcata** Welw. ms. in Herb.

A shrub 3 to 5 ft. high, erect or occasionally scandent; branchlets petioles rachis of the inflorescence and calyces softly tawny-pubescent; leaves opposite, ovate-oblong, shortly acuminate at the apex, rounded or cordate at the base, flat, membranous-papery, entire, $2\frac{1}{2}$ to $4\frac{1}{2}$ in. long by $1\frac{1}{4}$ to 2 in. broad, glabrous or nearly so except the puberulous margin and narrow veins beneath, dark green above, paler and whitish-green beneath; lateral veins about 5 on each side of the midrib; petiole $\frac{1}{5}$ to $\frac{1}{4}$ in. long, jointed about the middle; racemes axillary and terminal, many-flowered, including a peduncle of $\frac{1}{2}$ to $1\frac{1}{2}$ in., ranging to 3 in.; bracts narrowly lanceolate, more or less pubescent and petiolate, soon falcate-recurved, persisting some time after the fall of the flowers, $\frac{1}{4}$ to $\frac{2}{3}$ in. long, usually of a sulphur-greenish colour; pedicels $\frac{1}{10}$ to $\frac{1}{5}$ in. long, tawny-pubescent; flowers about $\frac{5}{6}$ to 1 in. long, erect or erect-patent; calyx-tube very narrowly obconical, clothed with short white pilose hairs; calyx-teeth linear-subulate from an ovate base, equalling the petals, promptly recurved; petals oval, $\frac{1}{12}$ in. long; fruit drupaceous, 1 in. long, of a whitish-rose colour, at length fuscous and broadly-winged, making the fruit $\frac{3}{4}$ in. diam.

Golungo Alto.—In secondary thickets between Sange and Bango; fl. June, sparingly in fr. Aug. 1855. No. **4348**.

Nearly related to the Natal plant *Q. parviflora* Gerr., differing from it by the falcate-recurved bracts and the long subulate recurved tips of the calyx-teeth.

8. **ILLIGERA** Blume; Benth & Hook. f. Gen. Pl. i. p. 689.

1. **I. pentaphylla** Welw. Sert. Angol. p. 26 (1869).

Golungo Alto.—A shrub, climbing to a great height, and then giving off branches 15 to 20 ft. long or more, pendulous vertically from the upper parts of trees; stems green or black-purplish or reddish, somewhat angular; leaves 5- to 3-foliolate; petiole bulbous-tumid at the base, reflexed, often twisted like a tendril, leaflets rigidly juicy-coriaceous, glossy on the upper face, pale and scattered on the lower face with black dots or glands; nerves very prominent, reddish when young; veinlets between the nerves horizontal, blackish; flowers greenish-yellowish; calyx-tube obtusely 4- or 5-angular; limb 5-cleft, green, spreading in a stellate manner; petals 5, linear-lanceolate, yellow-greenish, acuminate, inserted on the throat of the calyx, alternate

with its lobes and scarcely exceeding them ; stamens 5, inserted with and alternate to the petals ; filaments cylindrical, rather thick, free at the base, with 2 shorter whitish fleshy sub-spathulate rather turgid staminodes between them ; anthers large, 2-celled, inserted on both sides of the dilatedly capitate connectives, lateral, dehiscing with ellipsoidal yellow ear-shaped bent-back valves ; cells opposite, bursting in an elastic manner by means of a membrane ; pollen large, golden-tawny, globose ; ovary inferior, 1-celled, 1-ovuled ; style central, a little longer than the stamens, funnel-shaped ; stigma thickened with a flexuous edge ; fruit samaroid. Abundant but sporadic, at the borders of primitive forests among the mountains of Serra de Alto Queta and of Quilombo ; in fl. bud beginning of Dec. 1855, fl. Jan. and Feb. 1856, in young fr. beginning of Oct. 1855, fr. March 1856, and fully ripe fr. Sept. 1856. No. **1753**. Coll. Carp. 552 and 973.

By some misunderstanding these specimens were placed in the Flora of Tropical Africa, ii. p. 436, under *Gyrocarpus Jacquini* Roxb.

LIII. MYRTACEÆ.

Africa is but little favoured with the natural occurrence of Myrtaceæ : Welwitsch reckoned that only from 1 to $1\frac{1}{4}$ per cent. of the whole number of species in the world had been found native in that continent. This is the more surprising, since several species grow with exuberance and produce excellent fruit, while the soil and climate of tropical Africa have proved to be very favourable to all the introduced species. In Angola the indigenous species are by no means numerous, but it is probable that they will be found more abundant in the countries lying to the east. Most of the species are small trees belonging to the genus *Eugenia* ; many occur in the form of low shrubs in places cleared by the cutting down of forest trees for the purpose of cultivation and afterwards abandoned. It is worthy of mention that the vast quantity of the Guava trees which are met with constitute occasionally dense forests, as, for instance, on many islands situate in the river Quanza, and principally on those of Quitage, Bumba, and Calemba ; their fruits are equal in colour and fragrance to the guavas actually cultivated, but they are much larger and better flavoured. It will require a careful investigation to be made in the more remote interior of the continent in order to solve the problem whether these trees, which are reported to be really natives of America, are, however, indigenous in Africa, or are only the results of previous cultivation, and consequently are due to introduction in ancient times.

Nearly the same doubt respecting its true origin presents itself in relation to an arborescent species, not apparently distinct from *Eugenia Jambos* L., which is met with at the banks of brooks, constituting extensive thickets in and about forest ravines in Alto Queta, a high mountainous range of Golungo Alto, and which grows in great quantity in neglected stations remote from dwellings, and appears to be really indigenous in that region. The typical form of the species, which is the *Jamboeiro* of the Portuguese colonists, is not very common, and Welwitsch was unable

to taste its relishing fruit, since the Jambos cultivated in Golungo Alto is not very perfect, although not deficient in the rose-scent which characterises the original fruit from India. The Guiaveira (*Psidium Guajava* L.) and the Aracareiro (*P. guineensis* Swartz) are commonly cultivated nearly throughout the province, and they also luxuriate as if wild; the guava seldom attains in Angola, and then only under favourable conditions, a greater height than 25 ft., with a trunk of 6 in. in diameter, giving off at the height of 5 or 6 ft. strong lateral branches.

In Quitage and near Bumba, on his return from Quisonde to Pungo Andongo, in March 1857, Welwitsch purchased several baskets of excellent guava fruits, each basket containing 60 fine fruits, for a *vintem*—that is, 20 reis, about a penny. The wood of the guava tree is of a whitish-grey colour, somewhat verging on brown, fibrous, extremely hard and dry, and exceptionally durable; the negroes use it for frames of various kinds of musical instruments, for carving idols, and for spoons and other such utensils: this tree is the "Djamboe-Biedji" of the natives in the Dutch Indian archipelago.

The Pitangueira (*Eugenia uniflora* L.) produces excellent fruits, which are like cherries.

In the Apontamentos, p. 570, Welwitsch speaks of a species of *Syzygium* (*Eugenia*), which is a magnificent tree of 100 ft. in height and more, with a majestic evergreen head, and which adorns the banks of rivulets in Golungo Alto and Cazengo; this is perhaps *Eugenia guineensis*. In his ms. notes he also speaks of a beautiful evergreen tree, 15 to 25 ft. high in Huilla and 80 to 100 ft. in Bumbo, which is the Louro (laurel) or Loureiro of colonists in Huilla, and the native name is "Nohombo"; it is stately and very elegant, having coriaceous shining leaves, and throwing out, immediately after the first October rains, large bunches of white or brownish flowers, which from December and January to March and April are developed into dense bunches of olive-like berries, as large as a walnut or a little smaller, of a dark-purple or greenish-purple or red-blue colour, and slightly or acid-sweet to the taste and somewhat musky; the natives eat them with avidity, although when first masticated they are rank-musky and very disagreeable: they are nearly always on sale in the shops at Lopollo. The wood is brown, dense, and of a fine grain. It is very abundant in the neighbourhood of Bumbo and Lopollo, and in the whole of Serra da Xella, especially along streams. This is perhaps *Eugenia benguellensis* Welw.

1. **PSIDIUM** L.; Benth. & Hook. f. Gen. Pl. i. p. 713.

1. **P. Guajava** L. Sp. Pl. edit. 1 p. 470 (1753); Welw. Apont. p. 570 sub n. 170 (*P. Guaiava*); Ficalho Pl. Uteis p. 184 (1884) (*P. Guayava*).

P. pyriferum L. Sp. Pl. edit. 2 p. 672 (1762). *P. pomiferum* L., *l.c.*, p. 672; Laws. in Oliv. Fl. Trop. Afr. ii. p. 436; Ficalho in Bol. Soc. Geogr. Lisb. ii. p. 709 (1882).

Barra do Bengo.—Fruit delicious, 1 to 2 in. in diameter. By the river Bengo near Santo Antonio, cultivated and there almost wild; in late fl. and young fr. Dec. 1853. Called "Guiava" by the Portuguese colonists. No. **4577**.

Loanda.—At Imbondeiro dos Lobos; fl. Feb. 1858. No. **4583**. Fruit obtusely ellipsoidal, sweet-scented, shining with an oily gloss, yellow outside, flesh-coloured inside. Cultivated near the river Bengo, March 1858; seeds. Coll. Carp. 561.

Golungo Alto.—Mostly a shrub, but sometimes a small tree of 10 to 12 ft.; fruit eaten with avidity. In dense thickets and by streams about Mongolo, Muria, Trombeta, etc., abundant and ubiquitous. Near Sange, fl. and fr. Dec. 13th, 1854. No. **4579**. Fruit pear-shaped, as large as a moderate-sized hen's egg: aroma very agreeable. Cultivated in the Arimo of Senhor Mariano; seeds. Coll. Carp. 562.

Pungo Andongo.—A tree 20 to 25 ft. high; trunk ½ to 2 ft. in diameter at the base; bark chestnut-brown; fruit delicious, ellipsoidal-obovoid. On the Calemba islands, Bumba, etc., in large quantities, forming little woods, spontaneous; fl. 12 March, 1857. The Guiavas of the islands of Cacula, Calemba, Bumba, Quitage, etc., were the largest found by Welwitsch and the best-flavoured that he ever tasted; they were about the size of a small orange, but rather oblong, some of them nearly 3 in. long by 2½ thick: these fruits during the months of March, April, and May form one of the chief foods for the subsistence of the negroes of those parts. No. **4581**. A tree of 20 to 25 ft.; head widely spreading; fruit large, oblong, pear-shaped, delicious. On the islands in the river Cuanza, near Condo, Quitage, etc., very abundant; seeds March 1857. Coll. Carp. 563.

It is called "Goiabeira" by the Portuguese colonists.

2. **P. guineense** Swartz, Fl. Ind. Occ. p. 881 (1800); Welw. Apont. p. 589 n. 71; Laws. in Oliv. Fl. Trop. Afr. ii. p. 436.

P. Araca Raddi, Mem. p. 5 t. 1 (1821); Welw. Apont. p. 570 sub n. 170; Monteiro, Angola, ii. p. 297 (1875). *P. littorale* Raddi, *l.c.*, p. 6, t. 1, f. 2; Ficalho, Pl. Uteis, p. 184 (1884).

Icolo e Bengo.—An arborescent shrub; fruit small, of a size of that of *Pyrus Sorbus* L., yellow outside, whitish inside, very well flavoured, resembling a strawberry in aroma. Cultivated and wild in shrubby places by the river Bengo near Loanda; seeds March 1858. Coll. Carp. 560.

Barro do Bengo.—At Santo do Bengo, wild but scarcely indigenous; fl. Dec. 1853. No. **4578**.

Golungo Alto.—Fruit almost spherical, golden-yellow when ripe, with the aroma of a strawberry. In moist thickets, and especially in reedy places with species of *Pennisetum*, abundant throughout the district. Near Canguerasange; fl. Dec. 1854. Probably introduced in olden times from an unknown country, but quite wild for ages. Called by the natives "Araçá." No. **4580**.

Pungo Andongo.—An arborescent shrub. In Mata de Cabondo; fl. and fr. Dec. 1856 and Jan. 1857. It is doubtful whether this belongs here or to the previous species. No. **4582**.

2. **EUGENIA** Micheli, L.; Benth. & Hook. f. Gen. Pl. i. p. 718.

1. **E. coronata** Vahl ex DC. Prodr. iii. p. 271 (1828); Schum. & Thonn. in Danske Vid. Selsk. iv. p. 4 (1829); Laws. in Oliv. Fl. Trop. Afr. ii. p. 437. *Eugeniæ* sp., Horn. Anniv., p. 22 (1818).

Var. **hirtula** (Welw. ms. in Herb.).

A dwarf erect shrub, 1 to 1½ ft. high; the upper part of the stems and the peduncles somewhat shaggy; berries rubicund.

Pungo Andongo.—In sandy thickets near Luxillo; fr. Dec. 1856, fl. May 1857. No. **4390**.

Var. **salicifolia** (Welw. ms. in Herb.).

A dwarf shrub rarely a foot high, or occasionally attaining 15 in., occurring in masses, of a pleasant green, glabrous; leaves narrower and more rigid, 1 to 3 in. long, by ¼ to ½ in. broad.

Huilla.—In moist thickets at the skirts of forests, near Catumba, rather rare; fl. and fr. Dec. 1859. No. **4391**. Flowers white. In sandy-earthy thickets on the right bank of the river of Lopollo, abundant; late fl. Nov. 1859, fr. Jan. 1860. No. **4392**. In similar stations subject to annual burnings; fr. Dec. 1859 and Jan. 1860. No. **4393**.

2. **E. uniflora** L. Sp. Pl. edit. i. p. 470 (1753); Welw. Apont. p. 570 sub n. 170.

E. Michelii Lam. Encycl. Méth. iii. p. 203 (1789); Laws. in Oliv. Fl. Trop. Afr. ii. p. 437; Ficalho, Pl. Uteis, p. 184 (1884) (*E. Michelli*).

Icolo e Bengo.—A much-branched tree of 15 to 18 ft.; fruit like a cherry, acid-sweet, very agreeable but rarely developed in perfection in the interior of the coast region. Cultivated at Santo Antonio by the river Bengo; fr. Dec. 1853. Portuguese name "Pitangueira." No. **4576***c*.

Golungo Alto.—Cultivated rather rarely in arimos (meadows) on the bank of the river Cuango; fl. Dec. 1855. No. **4576**. Also about Sange. No. **4576***b*.

Island of St. Thomas.—Cultivated on Monte Caffé at 2000 ft. elevation; fr. Dec. 1860. Called "Pitangueira." Coll. Carp. 559.

3. **E. guineensis**.

Calyptranthes guineensis Willd. Sp. Pl. ii. p. 974 (1799). *Syzygium guineense* DC. Prodr. iii. p. 259 (1828); Perrott. & Guillem. Fl. Senegamb. p. 315 t. 72 (1833).

Ambriz.—A handsome tree, about 30 ft. high. In rocky forests between Ambriz and Quizembo, sporadic; almost finished fl. Nov. 1853. No. **4396**.

Golungo Alto.—An immense tree, with a trunk more than 3 ft. in diameter at the base, 35 to 50 high and more; head ovoid-hemispherical, spreading widely; branches and branchlets nodding; leaves coriaceous, but little shining, deep-green, pellucid-punctate; calyx-limb 4-lobed; lobes large, broad, arranged in a quadrangular manner; petals cohering in the form of a calyptra, open during the flowering, after the flowering thrown off, but not always so, greenish; filaments and anthers whitish; in very dense primitive forests by the river Delamboa; fl. Sept. 1856. One tree very lofty, certainly 100 ft. high, and trunk nearly 10 ft. in circumference at the base of the stem; in the forest of Quisucula. No. **4397**.

Var. **huillensis**.

Leaves rigidly coriaceous; petioles often shorter than those of the type, but ranging from ⅛ to ½ in. long.

HUILLA.—A dwarf shrub, 9 to 12 in. high, very gregarious, quasi-cæspitose ; stem erect or ascending ; flowers white ; fruit edible. On bushy pastures between Mumpulla and Nene, abundant ; fl. Oct. 1859. No. **4401**. A tree, about 12 ft. high ; fruit, when ripe, as large as a very fine cherry, from violet-greenish to purplish, at first somewhat musky, soon turning sweet-sourish. In the forests of Monino ; nearly ripe fr. Feb. 1860. No. **4402**. A small tree of 8 to 15 ft., with rambling branches and white flowers. In moist and also in the drier forests in the Monino country, in company with species of *Protea*, *Erythrina*, and *Acacia*, not uncommon ; fl. Nov. 1859, fr. Jan. 1860. No. **4403**.

4. **E. cordata** Laws. in Oliv. Fl. Trop. Afr. ii. p. 438 (*cordatum*).
Syzygium cordatum Hochst. ex Sond. in Harv. & Sond. Fl. Cap. ii. p. 521 (1862).

PUNGO ANDONGO.—A shrub of 6 ft. or perhaps the upgrowth from a mutilated tree. In thickets between Luxillo and Quilanga, sparingly ; fr. March 1857. No. **4399**. A shrub scarcely 2 ft. high with numerous stems, perhaps the progeny of a burnt or cut-down tree, with pellucid-punctate leaves (the pellucid dots rare and distant, but obvious) and monstrous greenish flowers ; in secondary thickets at the banks of the river Luxillo, near the bridge, Jan. 1857. A shrub of 4 ft., perhaps a mutilated tree, with whitish-greenish apparently imperfect flowers : in thickets at the borders of forests near Candumba, March 1857. A small mutilated tree, Muta Lucala, December 1856. No. **4400**.

HUILLA.—A small tree, more frequently an arborescent shrub, 6 to 10 ft. high ; branches lax ; leaves sessile, auriculate-cordate at the base. Conspicuously distinct from the other plants of the order in the Lopollo country. In rocky situations at the base of the mountains in Morro de Lopollo, abundant ; fr. beginning of Feb. 1860. No. **4404**.

5. **E. benguellensis** Welw. ms. in Herb.

A handsome tree, about 30 to 40 ft. high, occasionally only 15 to 20 ft., with a broad leafy head, glabrous ; branches subterate ; bark pallid or pale-reddish ; leaves opposite, oval or oval-oblong, rounded at both ends, sometimes somewhat emarginate at the apex, firmly coriaceous, minutely dotted, $1\frac{1}{2}$ to $3\frac{1}{2}$ in. long by $\frac{1}{2}$ to $1\frac{1}{4}$ in. broad ; lateral veins numerous, not strongly marked, making about 45° with the midrib ; petiole short, $\frac{1}{12}$ to $\frac{1}{10}$ in. long ; inflorescence cymose, terminal, $1\frac{1}{2}$ to 2 in. in diameter, many-flowered ; ultimate pedicels short ; bracteoles short, deciduous ; flowers whitish ; calyx-tube turbinate, $\frac{1}{6}$ to $\frac{1}{5}$ in. long ; limb 4-lobed, lobes rounded, spreading or reflexed, persistent ; filaments about $\frac{1}{2}$ in. long ; young fruit ellipsoidal, $\frac{1}{2}$ inch long.

BUMBO.—In primitive forests alongside streams near Bruco, at an elevation of 2800 to 3000 ft. ; fl. young, fr. Oct. 1859. No. **4394**. By the Bumbo stream, at the base of the mountains of Serra da Xella, in company with species of *Acacia*, *Adina microcephala*, and Sapotaceæ, abundant ; fl. Oct. 1859. No. **4395**.

6. **E. urophylla** Welw. ms. in Herb.

A glabrous tree, 30 ft. high ; trunk 2 ft. in diameter at the base ; head rather lax ; leaves elliptical, usually produced at the apex into a long narrow acumen, wedgeshaped at the base, firmly

coriaceous, glossy, dotted, blade 2½ to 4½ in. long by ⅞ to 1⅝ in. broad; margin narrowly revolute, lateral veins numerous, slender; petiole ⅜ to ¾ in. long; inflorescence cymose, terminal and subterminal, 2 to 4 in. in diameter; ultimate pedicels very short; bracteoles very small, deciduous; flowers white, ⅓ in. long; calyx turbinate, ⅙ in. long, 4-lobed, lobes very short, broad, obtuse, scarcely apiculate; petals 4, thrown off in a calyptrate manner; stamens inserted on a ring on the upper part of the calyx-tube; young fruit globose, ¼ to ⅓ in. in diameter.

PUNGO ANDONGO.—In wooded situations by the river Tangue within the lines of fortification; fl. May 1857. No. **4398**.

The following No. apparently is a monstrous state of this species :—

PUNGO ANDONGO.—A small tree of 10 ft.; leaves narrowly elliptical, coriaceous, glossy, distinctly dotted beneath; flowers (?) pseudomorphous, quite deformed and indeed scarcely to be considered flowers. In the denser forests of Mata de Cabondo, Feb. 1857. No. **4584**.

7. **E. Jambos** L. Sp. Pl., edit. i. p. 470 (1753); Elliot in Journ. Linn. Soc. xxx. p. 80 (1894), (*E. Jambosa*).

Jambosa vulgaris DC. Prodr. iii. p. 286 (1828); Welw. Apont. p. 570 sub n. 170. *J. australis* Ficalho Pl. Uteis, p. 184 (1884), non DC.

BARRA DO DANDE.—A very elegant tree, 20 to 25 ft. high, evergreen, with copious inflorescence, spreading branches, and nodding flowering and fruiting branchlets. Cultivated at the banks of the river Dande near Bombo, originally introduced from Brazil according to Pedro Alexandrino; fl. Sept. 1858. No. **4586**.

GOLUNGO ALTO.—Sometimes a shrub 3 to 5 ft. high, sometimes at the banks of the river Cuango a tree attaining 20 to 30 ft., with a trunk 3½ ft. in diameter; fruits when nearly dry scented like musk. In deep valleys along streams among the mountains of Serra de Alto Queta, very abundant and often almost exclusively occupying extensive tracts; fl. June 1855. Scarcely typical, as the corymbs are very highly compound, bearing upwards of 100 flowers. No. **4588**. A small tree or in secondary thickets a shrub of 5 to 8 ft.; corymbs very large, mostly terminal; pedicels purple, repeatedly branched, very brittle at the joints; flowers white. In very dense more elevated forests at the banks of streams among the mountains of the Eastern Queta; fl. and young fr. June 1855. No. **4590**. A small tree, more frequently a shrub of 5 to 6 ft., remarkable for the peculiar luxuriance of the flowers possibly due to insect-work. Abundant by mountain streams in the Central and Eastern Queta; fl. end of June 1856. No. **4589**. A small tree but mostly a shrub, flowers densely corymbose; dry fruits scented like musk, scarcely edible. Sange, fr. August 1855. COLL. CARP. 565.

PUNGO ANDONGO.—A small tree with lax branches and white flowers. Mata de Pungo; fl. end of May 1857. Probably an escape from cultivation. No. **4585**.

PRINCE'S ISLAND.—Among the rocks of Pico de Papagaio, rather rare, cultivated; without either fl. or fr. 21 Sept. 1853. No. **4618**.

ISLAND OF ST. THOMAS.—Frequently cultivated in the Island; without either fl. or fr., Dec. 1860. No. **4587**. COLL. CARP. 566.

This is called "Jamboeiro" or "Jambo" by the Portuguese colonists.

8. **E. Tungo** Hiern, sp. n.

A tree, 15 to 20 feet high, much branched, with a lax spreading head, glabrous throughout; with the habit of a coffee; branches and branchlets spreading at about 45°, whitish, the former subterete, the latter somewhat compressed towards the extremities; leaves simple, opposite, elliptical or roundly ovate, more or less acuminate at the apex, and wedge-shaped or obtuse at the base, rigidly coriaceous, glaucous-green, glossy above, slightly reddish beneath (in the dry state), remarkably pellucid-punctate, 2 to 3 inches long by 1 to $1\frac{1}{2}$ in. broad; margins entire, narrowly revolute; lateral veins numerous, spreading at a wide angle, not conspicuous; petiole $\frac{1}{4}$ to $\frac{3}{8}$ in. long, channelled above; infructescence cymose, apparently terminal, about 2 in. long; ultimate pedicels very short; fruit drupaceous, oblong-obovoid, about an inch long, yellow-reddish or green-reddish, edible, slightly and agreeably acid; flesh thin; seed solitary; embryo large.

Pungo Andongo.—In wooded thickets and at the banks of the river Cuanza from Quitage to Quisonde, abundant, principally on the Calemba islands and in their vicinity; fr. middle of March 1857. Called "Tungo do Cuanza," or "Tungu da catarata de Condo." No. **1245** and Coll. Carp. 564.

As is very frequently the case with tropical African fruits, the seed is large in proportion to the size of the fruit.

3. **PETERSIA** Welw. ex Benth. & Hook. f. Gen. Pl. i. p. 721 (Oct. 1865).

1. **P. africana** Welw., *l.c.*; Laws. in Oliv. Fl. Trop. Afr. ii. p. 439.

Golungo Alto.—A large tree, 30 to 80 feet high, somewhat resembling a *Barringtonia*; trunk 2 to 4 feet in diameter at the base, denuded of branches to the height of 20 feet; head very leafy, spreading, depressed at the apex; leaves punctate; calyx winged; petals adhering at the base to the staminal ring; stamens indefinite, deciduous with the corolla; fruit very broadly membranous-winged, not unlike that of Combretaceæ. In primitive forests, in moist deep valleys among the mountains of the Eastern Queta; fl. Feb. 1855; fr. end of July 1856. No. **4591.**

4. **NAPOLEONÆA** P. Beauv. ex Fr. Fischer in Mém. Soc. Nat. Mosc. i. p. 92 (1806).

Napoleona P. Beauv. (1810); Benth. & Hook. f. Gen. Pl. i. p. 723; non *Napoleone* Rob. Voy. Louis. i. p. 355, ii. pp. 322, 441 (1807).

1. **N. imperialis** P. Beauv. ex. Fr. Fischer in Mém. Soc. Nat. Mosc. i. p. 92 (1806).

Napoleona imperialis P. Beauv. Fl. Owar. ii. (pars xiii) p. 30, t. 78 (1810); Laws. in Oliv. Fl. Trop. Afr. ii. p. 439. *Belvisia cærulea* Desv. Journ. Bot. (Ser. 2) iv. p. 130 (1814). *N. angolensis* Welw. Apont. p. 571 sub n. 171, p. 586 n. 25; Mast. in Journ. Linn. Soc. x. p. 494 (1869); Miers in Trans. Linn. Soc., Ser. 2, i. p. 12 (July 1875).

Golungo Alto.—An arborescent bush, 12 to 20 ft. high, evergreen, resembling in its habit and glossy foliage a luxuriant *Camellia*, a really imperial ornament of the primitive forests; trunk slender, 2 to

$2\frac{1}{2}$, or rarely 3 in. in diameter ; bark of the trunk and older branches grey, rough ; branches erect-spreading at the apex, crowded in a whorled manner on the trunk, virgately elongated ; whorls 5 to 7 rarely $1\frac{1}{2}$ to 2 ft. distant, nodose-thickened ; branchlets and twigs drooping, beset in places with whitish-grey warts which become white, the younger branches acutely quadrangular, the older ones obtusely so, the youngest ones very acutely triquetrous ; leaves variable in size, mostly 6 to 7 in. long by $2\frac{1}{2}$ to 3 in. broad, coriaceous, deep-green above, paler and bright-green beneath, pellucid-punctate, oblong-lanceolate, repand or obscurely and obtusely dentate, obliquely terminated at the apex with a rounded-obtuse acumen an inch long ; petiole short, scarcely $\frac{1}{3}$ in. long, thick, gibbous, fleshy, curved, with an oily gloss shortly 2-winged by the decurrent blade ; no little glands at the base of the blade ; calyx-tube furnished at the base with broad ovate keeled white-greenish bracteoles, wholly blood-reddish, varnished-glossy ; calyx-lobes green, acuminate, thickened in a triangular manner at the apex ; corolla rather fleshy, imbricate-subcontorted in æstivation, snow-white at first shortly after the opening of the flower, afterwards turning rose-coloured, and finally yellowish, never bluish, the corona at the outer base purplish-peach-coloured ; stamens apparently 20 ; filaments broad, distant, cohering by means of a thin connecting membrane, monadelphous ; the alternate ones sterile ; anthers 10, actually extrorse, but by the bending of the staminal tube appearing to be introrse, apparently 1-celled ; stigma 5-angled, pitted at the concave apex, the angles slightly keeled from the centre towards the circumference, the keels ending at the apex in an erect bifid crest ; fruit resembling a pomegranate. In the more elevated primitive forests, in company with *Monodora Myristica* Dun. and a species of *Tetracera*, *Symphonia globulifera* L.f., *Dichapetalum angolense* Chodat, etc., fl. and fr. from Feb. to June, not abundant ; in the dense forests of the mountains of Queta, near Comuengue between N-delle and the river Luinha, with few fl. and fr., 21 May 1856 ; Moangue, N-delle, end of June 1856. No. **4592.** A small evergreen tree 7 to 15 ft. high, with subverticillate branches and whitish-rose handsome flowers. In primitive forests of the Queta mountains, with fl. buds fl. and ripe fr. on the same branch, May 1856. COLL. CARP. 568.

SIERRA LEONE.—A very elegant shrub ; flowers from whitish to rose-coloured. Freetown ; ripe fr. given to Welwitsch by Epfenhausen. COLL. CARP. 567.

LIV. MELASTOMACEÆ.

The proportionately very limited number of the Melastomaceæ in Angola, so far as yet discovered, notwithstanding the attention which has been devoted to their investigation, leads to the belief either that in Africa they are generally less abundant south of the equator than north of it, or that the greater part of them occur in the highlands of Songo, Duque de Bragança, and other countries lying east of the province. (Welwitsch, Apont. p. 570 n. 169).

1. **OSBECKIA** L.; Benth. & Hook. f. Gen. Pl. i. p. 744 (1867).

Antherotoma Hook. f. in Benth. & Hook. f., *l.c.*, p. 745.

1. **O. antherotoma** Naud. in Ann. Sc. Nat., Ser. 3, xiv. p. 56 (1850) ; Cogniaux in DC. Monogr. Phan. vii. p. 330 (1891).

Antherotoma Naudini Hook. f. in Benth. & Hook. f. Gen. Pl. i.

p. 745 (1867). and in Oliv. Fl. Trop. Afr. ii. p. 444; Triana in Trans. Linn. Soc. xxviii. p. 57, t. iv. f. 43 (1871).

Pungo Andongo.—An annual, erect, little herb, 3 to 4 (9) in. high, usually branched from the base; leaves membranous; flowers tetramerous, rosy; anthers emitting pollen at the small apex. On the more elevated exposed moist shortly-grassy declivities amongst the gigantic rocks of the fortress in Pedra Cazella; fl. and young fr. April 1857, ripe fr. May 1857. No. **909.** Annual, 3 to 5 in. high; by the lofty rocks of the fortress; fr. May 1857. Coll. Carp. 570.

Huilla.—A slender, erect, gregarious, little herb, hispidulous or occasionally pubescent, sparingly branched, a digit high or shorter; flowers in terminal clusters, of a pretty rosy colour, fugacious; petals 4; stamens 8, all alike; anthers truncate, pot-shaped (ceramiiform), and by this character distinguished from all other Angolan Melastomaceæ. In rocky situations along streams near Empalanca on the Humpata plain, at an elevation from 5200 to 5300 ft.; fl. and fr. beginning of April 1860. Along the grassy margins of streams and near the bottom of the rocks throughout the Humpata plain, at an elevation from 5000 to 5400 ft., very abundant; fl. and fr. 13 April 1860. No. **920.**

2. **O. Welwitschii** Cogniaux in DC. Monogr. Phan. vii. p. 333.

Pungo Andongo.—A sarmentose or subscandent undershrub, with rose-purple flowers. By the Canandûa river, within the fortress; fl. and fr. Jan. 1857. No. **907.** A shrub. In bushy places by the river Cuanza near Sansamanda, sporadic; fl. and fr. Feb. 1857. No. **907*b*.**

Ambaca.—A herb, apparently annual or biennial, 2 to 4 ft. high, quasi-scandent among shrubs, with rambling branches and rosy flowers. In mountainous swamps near Puri-Cacarambola; fl. Oct. 1856. No. **908.**

3. **O. hirsuta** Cogniaux in DC. Monogr. Phan. vii. p. 334 (1891).

Pungo Andongo.—An erect, rather rigid, strigulose herb, 1½ ft. high, with purplish flowers. In exposed pastures among short bushes at the margins of pools, between Condo and Quisonde and near Lombe. very rare; fl. and fr. March 1857. No. **905.**

4. **O. multiflora** Sm. in Rees, Cyclop. xxv. n. 7 (1813); Hook. f. in Oliv. Fl. Trop. Afr. ii. p. 442; Cogniaux, *l.c.*, p. 332 (1891). *Dissotis multiflora* Triana in Trans. Linn. Soc. xxviii. p. 58 (1871).

Golungo Alto.—An elegant erect herb, 2 to 3½ ft. high, with handsome violet-purple flowers. In the mountainous rather shaded parts of the more elevated forests of Sobato de Quilombo-Quiacatubia, from 2000 to 2500 ft. alt., on moist clay, very rare; fl. and fr. Feb. 1855. No. **898.**

2. **TRISTEMMA** Juss.; Benth. & Hook. f. Gen. Pl. i. p. 746.

1. **T. incompletum** Br. in Tuckey, Congo (App.), p. 435 (1818). *Melastoma sessilis* Schum. Beskr. Guin. Plant in Danske Vid. Selsk. Naturv. iii. p. 239 (1828). *T. Schumacheri* Guillem. & Perrott. Fl. Senegamb. p. 311 (1833); Hook. f. in Oliv. Fl. Trop. Afr. ii. p. 446; Cogniaux in DC. Monogr. Phan. vii. p. 361 (1891).

Var. **grandifolium** (Cogn., *l.c.*).

Golungo Alto.—An undershrub, woody at the base; stem ascending, obtusely quadrangular; calyx obovoid, 5-toothed; the teeth erect,

pluri-setose at the apex, girt at the throat with a short furfurfaceous ring, adhering only to the base of the ovary ; tube inside naked, glossy, polished ; petals 5 or 6 (on the same plant), inserted on the throat of the calyx, broadly ovate, truncate at the base, rosy, rather fleshy, very readily deciduous, scarcely ¼ in. long, beset on one side with glandular-ciliate hairs ; stamens 10 or 12 (even in the same flower-head 6 petals and 10 stamens were noticed), inserted with the petals, ascending in a curved manner ; anthers of two forms, each opening by one pore, alternate larger, rosy, not yellow as the others, all arched ; ovary superior, not half inferior, altogether embraced by the calyx, concave, truncate at the top, 5-setulose at the apex, 5-celled, with several ovules in each cell ; capsule baccate, beautifully purple, urceolate, crowned with the 5 reflected lobes of the persistent calyx, beset with a double row of hairs, soft when ripe ; seeds very numerous, imbedded in pulp. In moist very shaded woods and rugged situations at the sides of streams amongst the mountains of Serra de Alto Queta, sporadic (as are most of the species of this family seen by Welwitsch in Angola) ; fl. 7 Jan. 1855, fr. end of May 1855 ; Mata do Mangue, fl. April 1856. No. **900**.

2. **T. albiflorum** Benth. in Hook. Niger Fl. p. 353 (1849) ; Cogniaux in DC. Monogr. Phan. vii. p. 362 (1891).

Melastoma albiflorum G. Don, Gen. Syst. ii. p. 764 (1832). *T. Schumacheri*, var. *albiflorum* Hook. f. in Oliv. Fl. Trop. Afr. ii. p. 446.

Island of St. Thomas.—On the more elevated rocky wooded parts of Fazenda de Monte Caffé, very sparingly ; not yet flowering, Dec. 1860. No. **922**.

This determination is very doubtful.

3. **T. littorale** Benth. in Hook. Niger Fl. p. 353 (1849) ; Cogniaux in DC. Monogr. Phan. vii. p. 362 (1891).

T. Schumacheri, var. *littorale* Hook. f. in Oliv. Fl. Trop. Afr. ii. p. 446.

Pungo Andongo.—A shrub, 6 ft. high, with sparse and rambling branches ; stem simple at the base, as thick as a man's finger, purplish ; flowers large, rose-purple. By swamps and in the waters of the river Quanza at the island of Calemba ; the stem almost floating ; fr. and few fl. 12 March, 1857. No. **906**.

3. **DISSOTIS** Benth. ; Benth. & Hook. f. Gen. Pl. i. p. 746.

1. **D. capitata** Hook. f. in Oliv. Fl. Trop. Afr. ii. p. 449 ; Cogniaux in DC. Monogr. Phan. vii. p. 365 (1891).

Heterotis capitata Benth. in Hook. Niger Fl. p. 352 (1849). *Tristemma capitatum* Triana in Trans. Linn. Soc. xxviii. p. 56, t. iv. f. 41*d*. (1871).

Var. **Barteri** Cogn., *l.c.*

Pungo Andongo.—An erect, shaggy undershrub, 2½ to 3 ft. high. In rocky thickets near streams in Serra de Pedras de Guinga ; fr. March 1857. No. **903**. An erect herb, 2 to 3 feet high ; rootstock spongy ; stems numerous ; flowers pretty, purple. In damp thickets between Quitage and Bumba ; fr. and few fl. March 1857. This determination is doubtful. No. **903***b*.

Var. **Vogelii** Hook. f. in Oliv. Fl. Trop. Afr. ii. p. 450 ; Cogn., *l.c.* -*Heteropteris Vogelii* Benth. in Hook. Niger Fl. p. 352.

Sierra Leone.—An ascending perennial herb, 1 to 1½ ft. high, branched from the base ; leaves coriaceous, rather rigid, beneath turning yellowish in the dry state ; flowers prettily rose-purple ; calyx-lobes and petals tipped with fasciculate setæ ; capsule valvate ; valves tipped with fasciculate setæ ; seeds cochleate, delicately and densely tuberculate or punctulate. On grassy mountain declivities near Freetown, not uncommon ; fl. and fr. Sept. 1853. No. **896.**

2. **D. gracilis** Cogniaux in DC. Monogr. Phan. vii. p. 366 (1891).

Huilla.—In elevated, marshy, somewhat spongy, wooded meadows, in Morro de Monino, rather rare ; fl. and young fr. May 1860. No. **921.**

3. **D. lanceolata** Cogn. in DC. Monogr. Phan. vii. p. 366 (1891).

Pungo Andongo.—Perennial, erect, favoured with deep rose-purple flowers. In moist mountain-pastures amongst grass and short bushes at the banks of the river Luxillo, abundant and fragrant ; fl. May 1857. No. **910.** A perennial herb, 2 feet high, with thick spongy rootstock, numerous stems, and fragrant, very prettily rose-coloured flowers. In moist meadows along the banks of the river Cuanza, very abundant ; fl. and fr. April 30, 1857. No. **910***b*. In swampy thickets near Condo ; fl. and fr. March 1857. No. **910***c*. In moist sandy thickets near Quisonde ; fl. and fr. March 1857. No. **910***d*.

4. **D. debilis** Triana in Trans. Linn. Soc. xxviii. p. 58, t. iv. f. 44*a* (1871) ; Cogniaux in DC. Monogr. Phan. vii. p. 367 (1891). *Osbeckia debilis* Sond. in Linnæa, xxiii. p. 47 (1850), non Naud.

Huilla.—In rough exposed thickets, with sparing herbage, near Mumpulla ; not well developed, fl. Oct. 1859. No. **918.** A little herb ; rootstock woody ; stems cæspitose, ascending, 3 to 6 in. high, more or less purplish ; flowers handsome, of a deep-rose colour, arranged in terminal heads. In the more elevated grassy hilly situations, especially along the banks of streams, near Lopollo, abundant ; fl. and fr. beginning of December 1859. No. **919.**

5. **D. lævis** Hook. f. in Oliv. Fl. Trop. Afr. ii. p. 451 (Sept. 1871). *Melastoma decumbens* P. Beauv. Fl. Ow. i. p. 69, t. 41 (1806). *Osbeckia decumbens* DC. Prodr. iii. p. 143 (1828). *Heterotis lævis* Benth. in Hook. Niger Fl. p. 348 (1849). *D. decumbens* Triana in Trans. Linn. Soc. xxviii. p. 58 (Dec. 1871) ; Cogniaux in DC. Monogr. Phan. vii. p. 368 (1891).

Golungo Alto.—An ascending, prettily green herb, almost scandent, 2 to 3 ft. high ; petals rosy, very fugacious. In moist bushy places from Calolo to Sange also in palm groves of *Raphia* near Cangueras-sange, nowhere abundant ; fl. and fr. Sept. and Nov. 1854 ; also at the ferruginous spring near Bango, fr. April 1856. No. **899.** A herb of 2 to 3 ft., with rose-coloured flowers. In the forest at the sides of the Quiapose, in Sobato de Bumba ; fr. 22 Oct. 1855. Coll. Carp. 572.

6. **D. plumosa** Hook. f. in Oliv. Fl. Trop. Afr. ii. p. 452 (Sept. 1871).

Osbeckia rotundifolia Sm. in Rees, Cycl. xxv. n. 4 (1813). *Melastoma plumosa* D. Don in Mem. Werner. Soc. iv. (Part 2) p. 291 (1823). *Heterotis plumosa* Benth. in Hook. Niger Fl. p. 348 (1849).

D. rotundifolia Triana in Trans. Linn. Soc. xxviii. p. 58 (Dec. 1871); Cogniaux in DC. Monogr. Phan. vii. p. 369 (1891).

Golungo Alto.—A little low undershrub, growing after the fashion of *Linnæa borealis* L.; stems prostrate or creeping, rooting at the nodes, very slender; flowering branches erect; flowers of a pretty rose colour, large for the size of the plant; anthers of a deep dull yellow-orange colour. In the most elevated forests of Sobato Quilombo-Quiacatubia, creeping amongst moss in shaded places; fl. and young fr. Feb. 1855. A slender form. No. **897**.

Seen also by Welwitsch in Prince's Island, at Papagaios, Sept. 1853, but there is not any specimen in the collection.

7. **D. angolensis** Cogn. in DC. Monogr. Phan. vii. p. 371 (1891).

Huilla.—In marshy, bushy pastures, by the streams of Ferrão da Sola; fl. beginning of May 1860. No. **913**. An erect perennial tomentellous herb, 2 to 3 ft. high; flowers bright rose-purple and sometimes pale violet-purple. In swampy meadows with dense grass and low bushes, at the great lake of Ivantâla; fl. and fr. Feb. and April 1860. No. **914**.

8. **D. Welwitschii** Cogn. in DC. Monogr. Phan. vii. p. 371 (1891).

Huilla.—Flowers brilliantly violet-purple. On elevated, wooded, densely grassy declivities, along streams in Morro de Lopollo, abundant; fl. Jan., young fr. April 1860. No. **917**. An undershrub, 3 to 4 rarely 5 ft. high; stems gregarious, erect, winged-tetragonal; leaves ovate-lanceolate, very bright green; flowers paniculate, large, very handsome, deep violet-purple. By streams in Serra de Lopollo, at an elevation of 5200 feet; fr. April 1860. Coll. Carp. 89 and 575.

9. **D. longicaudata** Cogn. in DC. Monogr. Phan. vii. p. 373 (1891).

Huilla.—A small slender tree, 15 to 20 ft. high; leaves with scattered adpressed hairs on the upper face; calyx-teeth caducous. In wooded thickets along streams in the most elevated parts of Morro, (Serra) de Lopollo; fl. and young fr. May 1860. No. **915**. Arborescent 10 to 15 ft.; trunk 2 to 6 in. in circumference; fr. Coll. Carp. 571.

The following probably belongs to this species, though the corresponding specimens have not been found:—

Huilla.—A shrub of 14 to 18 ft. or a slender little tree, evergreen, with very handsome violet-purple flowers. In Morro de Huilla, at 5600 ft. alt., May 1860. Coll. Carp. 73.

10. **D. Candolleana** Cogn. in DC. Monogr. Phan. vii. p. 373 (1891).

Pungo Andongo.—In damp meadows between Quitage and Condo, occasionally; fl. and fr. March 1857. No. **904**. A small, erect, branched shrub, 3 to 4 ft. high. By the streams of Funda Quilombo; fr. Dec. 1856. No. **904***b*. In marshy thickets by the river Muxillo; fl. and fr. beginning of Dec. 1856. No. **904***c*. An erect shrub. 3 ft. high; flowers not yet seen. In the elevated marshy parts of the rocks of Pungo Andongo; fr. end of Oct 1855. Coll. Carp. 573.

11. **D. crenulata** Cogn. in DC. Monogr. Phan. vii. p. 376 (1891).

Huilla.—An erect shrub, very much branched, 4 to 6 ft. high; primary stems springing in a cæspitose manner from the rootstock: branches and branchlets spreading. In damp thickets at the base of Morro de Lopollo, not abundant; fr. Dec. 1859; very few fl., May

1860. No. **916**. An erect branched shrub, 4 to 6 ft. high; stems numerous; leaves ovate or ovate-lanceolate, tomentose; flowers large, handsome, violet-purple. In thickets by streams near Lopollo; fl. April 1860; fr. Dec. 1859. COLL. CARP. 574.

4. **AMPHIBLEMMA** Naud.; Benth. & Hook f. Gen. Pl. i. p. 754.

1. **A. cymosum** Naud. in Ann. Sc. Nat., Sér. 3, xv. p. 51 (1851), and xiv. t. 7. f. vii. (1850); Hook. f. in Oliv. Fl. Trop. Afr. ii. p. 456; Cogniaux in DC. Monogr. Phan. vii. p. 528 (1891).

Melastoma cymosum Vent. Jard. Malm. t. 14 (1803). *M. corymbosa* Sims Bot. Mag. t. 904 (1806). *Heterotis* (sp.), Benth. in Hook. Niger Fl. p. 352 (1849).

GOLUNGO ALTO.—A suffruticose herb, 2½ to 3½ ft. high; stem tetragonal; leaves membranous, rather rigid, intensely green; flowers violet-purple. In densely shaded situations by the sides of streams among the mountains of Serra de Alto Queta, sparingly; fl. Jan., fr. March 1856. No. **901**. A perennial herb, 2½ to 4 ft. high; stem 4-winged; leaves very large, pale green; flowers rosy; petals very caducous. At the cataract, Zengas de Queta, rather rare; capsules and seeds, March 1856. COLL. CARP. 569.

CAZENGO.—In the very dense, elevated forests of Muxaûla, on the left bank of the river Luinha, very rare; fr. and very few fl. June 1855. No. **902**.

5. **MEMECYLON** L.; Benth. & Hook. f. Gen. Pl. i. p. 773.

1. **M. membranifolium** Hook. f. in Oliv. Fl. Trop. Afr. ii. p. 462; Cogniaux in DC. Monogr. Phan. vii. p. 1135 (1891).

PUNGO ANDONGO.—A small tree, with whitish bark, blue flowers, and blue edible berries. In the primitive forests of Mata de Pungo, near Pedras de Pungo; fl. Jan., fr. May 1857. No. **912**.

2. **M. polyanthemos** Hook. f., *l.c.*, p. 463; Cogniaux, p. 1160.

PUNGO ANDONGO.—A very elegant, patently branched tree of 10 to 15 ft.; leaves hard-coriaceous, uninerved, impunctate, glossy, evergreen; flowers deep-blue, abruptly and acutely conical in the bud; calyx-limb repand, 4-subdentate; petals 4; stamens 8, erect; anthers 2-celled, white; cells diverging at the base, dehiscing longitudinally; ovary 2-celled. Berry spherical, beautiful clear-blue; juice coloured deep-blue; seed solitary (or very rarely 2), exalbuminous; cotyledons fleshy, thick, very intricately conduplicate. In little rocky woods at the base of the gigantic rocks of Barrancos de Catete, near Catete, sporadic; fr. and sparingly fl. Nov. and 5 Dec. 1856. A small tree of 12 ft.; fr. end of April 1857. No. **911**.

The following note from Welw. Synopse, p. 4, n. 7 probably refers to this, or possibly to the previous species of the genus, or to both; Ficalho in Bol. Soc. Geogr. Lisb. ii. p. 709 (1882) refers it doubtfully to *M. fasciculare* Planch., and in Pl. Uteis p. 184 (1884) to *M. Vogelii* Naud.:—"Cosanza" is the native name of a small tree of remarkable elegance, belonging to this family; it occurs chiefly in rocky forests from Pungo Andongo to Songo, and its wood is valued by the natives for the purpose of manufacturing various domestic and defensive implements, as, for instance, the

handles of hatchets, etc.; the fruit of this tree, which consists of clear blue berries, is eaten by the natives. Apparently the same plant (or plants) is that mentioned by Welwitsch, Apont. p. 570, under n. 169, as a slender tree, belonging to the sub-order Memecyleæ and indigenous in Pungo Andongo, with well-flavoured blue berries; these when eaten colour the lips black, and thus point to the origin of the name *Melastoma*.

LV. PLECTRONIACEÆ.

1. **PLECTRONIA** L. Mant. Pl. (i.) p. 6 (1767), neque DC. nec Benth. & Hook. f. *Olinia* Thunb. in Röm. Archiv. ii., pars 1, p. 4 (1799); Benth. & Hook. f. Gen. Pl. i. p. 785.

1. **P. ventosa** L. Mant. Pl. (i.) p. 52 (1767), excl. syn.; Herb. Linn. !; neque DC. nec Sond.

Olinia cymosa Thunb. Röm. Archiv. ii., pars 1, p. 4 (1799); Sonder in Harv. & Sond. Fl. Cap. ii. p. 520 (1862); Hiern in Oliv. Fl. Trop. Afr. ii. p. 485. *P. floribunda* Buchinger ex Krauss in Flora, 1844, p. 348.

Huilla.—A shrub 4 to 7 ft. high, branched nearly from the base; branches nodose, patent; branchlets acutely tetragonal; leaves varying from elliptical to ovate, rather obtuse and emarginate at the apex, thinly coriaceous, deep-green above, paler beneath, midrib and veins beautifully atro-sanguineous, densely pellucid-venulose, margin narrowly cartilaginous; flowers very sweetly fragrant with the aroma almost of *Daphne*; calyx green, truncate at the mouth, obscurely 5-toothed; petals (possibly to be considered calyx-lobes?) 5, always petaloid, whitish, sessile with a broad base on the inner face of the throat or limb of the calyx, alternating with 5 interposed scales; stamens 5, opposite the scales and inserted below them; ovary minute, 5-celled or sometimes only 3- or 4-celled; ovules pendulous from a central column; style straight, firm, subcoriaceous, sparingly but constantly pilose with spreading hairs; stigma truncate. In rocky hilly thickets between Humpata and Lopollo, sporadic; fl. 30 Dec. 1859. Near Lopollo; fl. March 1860. No. **991**.

Welwitsch, in a letter to me, 16 Sept. 1870, with reference to this plant wrote as follows:—"In the living plant the so-called petals look very different in colour, structure, and consistence from the calyx; besides, the insertion seemed to me always to be inside the calycine margin. The white bracts at the base of the flowers I have never found so conspicuous as they seem to occur on the Cape plant; coloured bracts, of the same colour as the flowers, are very frequent among Combretaceous genera, but never a multilocular ovary."

Olinia usambarensis Gilg in Eng. & Prantl. Nat. Pflanzenfam. iv. 3, p. 216 fig. 74A—G (p. 215) (1894) and in Engl. Bot. Jahrb. xix. p. 278 (1894) agrees in the dry state very closely with our specimens; it was collected by Holst n. 9115 in the elevated forest-region of Usambara at Kwa Mochuza in August 1893.

This genus presents points of difficulty in many respects, and especially with reference to its structure, its position in the Calycifloræ, the limitation of its species, and its correct name.

There seems little doubt but that Linnæus had a specimen of the genus under consideration when he described *Plectronia* for the Mantissa (1767), for his description and the specimen in his herbarium, subscribed in his own writing with the name *Plectronia ventosa*, now at the Linnean Society, both establish this view; he, however, complicated the matter by quoting a plate from Burmann of a plant in fruit which appears to belong to *Canthium* in Rubiaceæ, though he implied that he had not seen the plant figured in Burmann. In this way some authors have sunk the name of *Canthium* and substituted for it that of *Plectronia* for the Rubiaceous genus, while *Olinia* of Thunberg has been generally used for the true *Plectronia* L.

The structure has been fully discussed by Decaisne, "Sur les caractères et les affinités des Oliniées," in 1877; by Baillon, "Nouvelles Observations des les Olinia" in 1878; and by Gilg in Engler and Prantl, Nat. Pflanzenfam., in 1892. The number of species comprised in the genus is variously estimated as from 1 to 5 or 6. The most recent opinion agrees with several early ones, that these plants constitute a distinct natural order, which has been called Oliniaceæ; but if the name *Olinia* must be discontinued for the genus, a corresponding change is obviously suggested in the case of the Order.

LVI. PUNICACEÆ.

1. **PUNICA** Tournef, L.; Benth. & Hook. f. Gen. Pl. i. p. 784.

1. **P. Granatum** L. Sp. Pl. edit. 1, p. 472 (1753); Welw. in Journ. Linn. Soc. v. p. 184 (1861); Hiern in Oliv. Fl. Trop. Afr. ii. p. 486; Ficalho, Pl. Uteis, p. 185 (1884).

Golungo Alto.—A small tree or large shrub, much branched, 8 to 12 feet high; fruit of moderate size. Cultivated and spontaneous, but not indigenous, in the old garden of the Italian missionaries at the convent of Bango Aquitamba and in thickets; fl. and young fr. 1 May 1856, called "Romeira" or "Ramanzeira." No. **2333**.

LVII. LYTHRACEÆ.

The Angolan Lythraceæ consist chiefly of low annual herbs, rather rare in the coast region up to 1000 feet of altitude and little frequent in the mountainous region ranging from 1000 to 2400 feet, but abundant in the marshy lands and moist meadows in the neighbourhood of the river Cuanza from Pungo Andongo to Quisongo. Though the greater part of the species consist of plants so small that with reason they might be considered as the pigmies of the Angolan flora, yet some among them do not fail in elegance, and others are remarkable for the red or crimson colour with which their stems, leaves and calyxes at the time of fructification are tinged; and when seen from afar they resemble purple carpets spread over the green meadows. See Welwitsch, Apontamentos, p. 569, n. 168.

1. **ROTALA** L. Mant. Pl. ii. pp. 143, 175 (1771). *Ammannia* Benth. & Hook. f. Gen. Pl. i. p. 776 (partly).

1. **R. mexicana** Cham. & Schlecht. in Linnæa, v. p. 567 (1830). Subsp. **Hierniana** Koehne in Engl. Bot. Jahrb. i. p. 151 (1880). *R. verticillaris* (L.), var. *β. Spruceana* Hiern in Oliv. Fl. Trop. Afr. ii. p. 467.

Pungo Andongo.—On watery mud, among short herbage, in company with *Utricularia exilis* Oliv.; about Lagõa de Quibinda; fl. and fr. March 1857. No. **2337**.

Koehne of Berlin distinguishes the above from *Rotala verticillata* L. by the insertion of the stamens being scarcely above the base of the calyx instead of a little above the middle, and by the absence of petals. Both species have a wide distribution over hot countries.

2. **R. myriophylloides** Welw. ex Hiern in Oliv. Fl. Trop. Afr. ii. p. 469; Koehne in Engl. Bot. Jahrb. i. p. 154 (1880).

Huilla.—An aquatic herb, floating, apparently annual, gregarious; rhizome creeping, stoloniferous; stems cylindrical, pseudo-articulate, branched here and there, verticillately leafy at the nodes, interrupted towards the apex with whorls of flowers after the fashion of *Myriophyllum verticillatum* L.; joints longitudinally striate; flowers hermaphrodite, of a deep-rose colour, dimorphic, arranged in spikes which rise above the water; calyx campanulate, rosy, almost coralline, 4-lobed; lobes broadly ovate, rather acute; cornua wanting or represented by gland-like points; petals 4, obovate or ovate-oblong, of a deep-rose colour, longer than the calyx; stamens 4, all fertile, inserted near or a little above the base of the calyx-tube, far exserted in the short-styled flowers and included in the long-styled flowers; style filiform, straight, much shorter than the calyx in the short-styled flowers and far exserted in the long-styled flowers; stigma capitate, subtruncate; capsule rose-bloodred, ovoid or obovoid turgid, tipped by the persistent style, many-seeded. Floating in or at the margins of rivulets or rooting at the bottom of the shallower streams, always in broad clumps, between Nene and Ohai, at an elevation of 5000 feet; fl. and young fr. middle of May 1860. No. **2348**.

3. **R. serpiculoides** Welw. ex Hiern in Oliv. Fl. Trop. Afr. ii. p. 469; Koehne in Engl. Bot. Jahrb. i. p. 158 (1880).

Huilla.—An annual herb, scarcely a digit high; stems erect, but little branched; leaves linear; flowers reddish, sparingly supplied with petals. Abundant and gregarious, in moist sandy wooded places, in company with species of *Utricularia*, near the Monino; at an elevation of 5000 ft.; fl. and fr. April 1860. No. **2355**. An erect, branched, annual herb, 1 to 3 in. high; leaves linear; flowers axillary, reddish. In the marshy pastures of the Monino; fr. beginning of April 1860. Coll. Carp. 582.

4. **R. decussata** DC. Prodr. iii. p. 76 (1828); Hiern in Oliv. Fl. Trop. Afr. ii. p. 467, excl. syn.; Koehne, *l.c.*, p. 160.

Pungo Andongo.—In muddy-sandy places sometimes flooded, about Lombe, but not abundant; fl. and fr. March 1857. No. **2339**. Plant reddish when old, resembling in habit *Centunculus minimus* L.; calyx 4-lobed, with linear cornua; stamens 4; capsule 3-valved, widely cæspitose. In nearly dried up swamps near Quibinda, along the river Cuije; fl. and fr. March 1857. No. **2340**. Annual. In marshes near

Quibinda ; seeds, March 1857. Coll., Carp. 577 (part). In the deeper pools, in company with *Thalia Welwitschii* Ridl. (Welw. Herb. No. 6445), near Mutollo, Serra das Pedras de Guinga ; fl. and fr. March 1857. No. **2343**.

5. **R. filiformis** Hiern in Oliv., *l.c.*, p. 468 ; Koehne, *l.c.*, p. 167. *Suffrenia filiformis* Bellardi in Mem. Acad. Sc. Turin vii. p. 445, t. 1, f. 1 (1804).

Forma **Hiernii** Koehne, *l.c.*, p. 168.

Pungo Andongo.—Widely cæspitose, half immersed in drying-up pools about Lagôa de Quibinda ; fl. and fr. March 1857 ; specimens quite like the Italian form. No. **2342**. In marshes, near Quibinda ; seeds, March 1857. Coll., Carp. 577 (part). On Ilhas de Calemba in the river Cuanza ; at the edges of pools, in clumps, rather scarce ; fl. and fr. March 1857 ; specimens with a few narrow submerged leaves. No. **2341**.

Huilla.—A dwarf annual loosely tufted herb, scarcely 1½ in. high ; calyx mostly purple ; capsule at length dark-purple ; leaves truncate or abrupt, scarcely bifid at the apex ; in fruit almost exactly resembling *Tillæa muscosa* L. In sandy pastures, flooded in summer, along the river Monino, in some quantity, but seen only in one spot ; fl. and fr. beginning of April 1860. No. **2338**.

6. **R. fontinalis** Hiern in Oliv., *l.c.*, p. 468 ; Koehne, *l.c.*, p. 172.

Pungo Andongo.—An elegant herb ; stem creeping, giving off fibres at the nodes ; branches erect ; leaves bifarious, glaucous-green ; flowers always much shorter than the floral leaves ; calyx 4-cleft with acute and spreading deltoid teeth and limb inside of a deep rose colour ; petals 4, ovate-subcordate or obovate-spathulate, shortly clawed, longer than the calyx ; rather fleshy ; stamens 4, exserted ; ovary more or less conical, 4-celled, septa at length evanescent ; style filiform, exserted ; stigma capitate. Abundant in marshes along the banks of clear slowly flowing streams, near Candumba and Mutollo ; fl. and young fr. in March 1857. No. **2347**. In muddy marshes near Lombe and also near Quisonde ; fr. March 1857. No. **2346**.

7. **R. nummularia** Welw. ex Hiern in Oliv. Fl. Trop. Afr. ii. p. 468 ; Koehne in Engl. Bot. Jahr. i. p. 177 (1880).

Huilla.—A slender, creeping, apparently perennial little herb, glaucous-greenish, growing after the fashion of *Glaux maritima* L., the whole plant exactly with the habit of *Thymus* ; flowers lilac or violet-purple. In nearly dried-up places at the banks of the river Quipumpunhime, between Mumpulla and Nene, abundant, but seen in only one spot ; fl. and young fr. Oct. 1859. No. **2344**. An elegant, glaucous-green, rather fleshy, apparently perennial herb, growing on sufficiently broad tufts ; stems erect, crowded ; flowers tetramerous, of a bright-rose colour ; calyx petaloid, rosy, bi-bracteolate, deeply lobed ; lobes erect, deltoid, equal ; petals obovate, twice the length of the calyx, shortly clawed, persistent for a long time and marcescent ; stamens 4 ; stigma capitate ; capsule valvate, at length 1-celled. In marshy places along the banks of streams and in the nearly dry beds of the streams about Lopollo, at an elevation of 5000 to 5500 ft., abundant ; near Catumba, fl. and young fr. Jan. 1860. The flowers are dimorphic, some flowers having the stamens exserted and longer than the style, while others have the style longer than the stamens. No. **2345**.

2. **AMMANNIA** Houst., L.; Benth. & Hook. f. Gen. Pl. i. p. 776 (partly).

1. **A. senegalensis** Lam. Tabl. Encycl. et Méthod. i. p. 311, n. 1553 (1791), t. 77 fig. 2; Hiern in Oliv. Fl. Trop. Afr. ii. p. 477.

Var. **auriculata** Hiern, *l.c.*; *A. auriculata* Willd. Hort. Berol. i. p. 7 t. 7 (1806); Koehne in Engl. Bot. Jahrb. i. p. 244 (1880).

Mossamedes.—Leaves sessile, auriculate; flowers disposed in shortly pedunculate small trichotomously divided axillary cymes; capsules bursting irregularly or circumsciss; leaves sessile, auriculate at the base. In sandy places with scanty herbage, formerly flooded near the estuary of the river Bero and towards the river Giraûl, sporadic; fl. and fr. in winter, August 1859. No. **2350**.

Var. **patens** Hiern, l.c.; *A. vesicatoria* T. Thoms. in Speke Journ. App. p. 634 (1863), non Roxb.; *A. senegalensis* Koehne in Engl. Bot. Jahrb. i. p. 235 (1880).

Golungo Alto.—Annual or biennial, a foot high; stem ascending, more rarely straight, sometimes rooting, purplish. Rather rare, in muddy places about marshes in wooded places near Calôlo; fl. and fr. Sept. 1854. No. **2352**. Annual. In spongy places near Calôlo, abundant; fr. Sept. 1854. Coll. Carp. 576. About swamps along rivulets, near Trombeta, Sept. 1854. No. **2352***b*.

Var. **multiflora** Hiern, *l.c.*; *A. multiflora* Roxb. Hort. Beng. p. 11 (1814); Koehne in Engl. Bot. Jahrb. i. p. 247 (1880).

Ambaca.—On the left bank of the river Caringa, at an elevation of 2900 ft., also near the margins of the lake Moembege, in the neighbouring district of Cazengo; fl. and fr. June 1855. No. **2353**. An annual erect much-branched herb, with small rose-coloured flowers, about marshes near the banks of the river Lucala, and near Hálo by swamps; at an elevation of 2900 ft.; fl. and fr. Oct. 1856. No. **2354**.

Pungo Andongo.—An annual erect fen-herb, with spreading branches; petals 4, rose-coloured. Sparingly in moist wooded meadows, near Sansamanda, in company with *Isoëtes æquinoctialis* Welw. No. 50; fl. May 1st, 1857. No. **2351**.

Var. **brasiliensis** A. St. Hil. Fl. Bras. Mér. iii. p. 135 t. 187. (1833); Hiern, *l.c.*; *A. auriculata*, var. *arenaria* Koehne in Engl. Bot. Jahrb. i. p. 245 (1880).

Pungo Andongo.—About pools then dried up on the Ilbas de Calembe, in the river Cuanza, a few specimens; fl. and fr. March 1857. No. **2358**. By pools near Muta-Lucala, along the banks of the river Cuanza; March 1857. No. **2358***b*. Erect or ascending; leaves bright green, broadly auriculate at the base. Frequent near Lombe, in moist sandy-muddy places along the banks of the river Lombe; fl. and fr. March 1857. No. **2359**. An annual herb, a hand high; flowers very small, rosy. Condo, fl. and fr. March 1857. Coll. Carp. 584.

Mossamedes.—Flowers reddish. Rather rare in sandy-muddy places with sparse herbage at the banks of the river Bero (or Rio das Mortes), Mata dos Carpinteiros, near Cavalheiros; fl. and fr. beginning of August 1859. No. **2360**.

The next following two Nos. probably belong to this species, but the material is too poor for positive determination :—

AMBACA.—In wet places by the banks of the river Pamba, near N-gombo, a unique specimen in fr. without leaves Oct. 1856. No. **2372**.

PUNGO ANDONGO.—In wet meadows near Lombe, towards Muta-Lucala, a young specimen without fl. or fr. beginning of March 1857. No. **2369**.

2. **A. baccifera** L. Sp. Pl., edit. 1, p. 120 (1753) (*Amannia*); Hiern in Oliv. Fl. Trop. Afr. ii. p. 478.

A. attenuata Hochst. in Herb. Schimp. Abyss. ii. n. 778; A. Rich. Tent. Fl. Abyss. i. p. 278 (1847); Koehne in Engl. Bot. Jahrb. i. p. 257 (1880).

PUNGO ANDONGO.—Abundant in sandy places flooded in summer, from Candumba to Lombe along the banks of the river Cuanza; fl. and fr. March 1857. No. **2356**.

MOSSAMEDES.—In swamps by the river Bero, near Mossamedes; fl. and fr. July 1859. No. **2357**. COLL. CARP. 579 (part). In swamps by the shore of the river Bero, not far from its mouth, in excessively wet sand almost surging under foot; fl. and fr. July 1859. No. **2357***b*.

This Linnean species occurs also in Nile Land, and is widely spread over tropical and subtropical Asia and Australia. The form, however, represented by the name *A. attenuata*, as emended by Koehne, is of much more limited distribution; and to this form Dr. Welwitsch's specimens belong.

3. **A. salicifolia** Monti in Comment. Instit. Bonon. v. pars i. p. 112, cum tab. (1767); Hiern in Oliv. Fl. Trop. Afr. ii. 478.

A. baccifera Koehne in Engl. Bot. Jahrb. i. p. 258 (1880), et subsp. *ægyptiaca* Koehne, *l.c.*, p. 260, and in Nuov. Giorn. Bot. Ital. xvi. p. 101 (1884).

PUNGO ANDONGO.—In marshy places with dense herbage near Quitage by the river Cuije, not abundant; fl. and fr. March 1857. No. **2362**. In a sandy spot with short herbage at the bank of the river Lombe not far from its confluence with the river Cuanza; only one little specimen seen, 3 in. high; fl. March 1857. No. **2371**. Along streams within the fortress of Pungo Andongo, sporadic; fl. and fr. April 1857. No. **2349**. By marshes near Sansamanda by the river Cuanza, in company with *Aponogeton leptostachys* E. Mey (Welw. Herb. No. 301); fl. and fr. May 1857. No. **2363**.

MOSSAMEDES.—Flowers reddish. In sandy and muddy places along the banks of the river Bero, near Cavalheiros, sporadic; fl. and fr. July 1859. No. **2364**. COLL. CARP. 579 (part).

3. **NESÆA** Commers.; Benth. & Hook. f. Gen. Pl. i. p. 779.

1. **N. loandensis** Koehne in Engl. Bot. Jahrb. iii. p. 325 (1882).

Ammannia loandensis Welw. ex Hiern in Oliv. Fl. Trop. Afr. ii. p. 480.

LOANDA.—A quite glabrous, deep-green, annual herb; stems several from the crown of the rootstock, prostrate, quadrangular, of a deep bloodred-purple colour; branches opposite, very numerous, ascending; leaves opposite, lanceolate, or oval-oblong, ½ to nearly 1 in. long, ¼ in. broad in the middle, attenuate at the base into a very short petiole, deep-green, subglaucescent beneath, very delicately serrulate on the margin; flowers tetramerous, crowded in little axillary cymes; common peduncle almost obsolete; pedicels very slender, unequal, the longer

ones scarcely $\frac{1}{12}$ in. long, erect-spreading, bibracteolate at the base; calyx 8-striate, purplish, elongate campanulate, with 4 erect-connivent broadly deltoid apiculate lobes and 4 alternating longer cornua, which soon spread horizontally; petals wanting or very rare; stamens 4; anthers yellow, didymous, rather large; ovary 2-celled; placenta central, somewhat compressed; style short, not exserted, rather thick, straight; stigma capitate; capsule globose, bursting in a circumsciss or irregular manner. On sandy clay by artificial ponds (Represas) near Conceição, sporadic; fl. and fr. July 1854. No. **2366**. On the margin of the artificial pond at Museque de Luiz Gomes, not far from Loanda; only one specimen, 2 in. high, seen; in fl. bud Feb. 1858. Apparently belonging to this species. No. **2370**.

2. **N. aspera** Koehne in Engl. Bot. Jahrb. iii. p. 327 (1882).
Ammannia aspera Guillem. & Perrott Fl. Senegamb. (i.) p. 304 (1833); Hiern in Oliv. Fl. Trop. Afr. ii. p. 480.

Mossamedes.—Cymes trichotomous; pedicels uni-bracteolate at the base; calyx ebracteolate, membranous, greenish, afterwards rose-coloured; petals wanting. In sandy-muddy marshes along the banks of the nearly dried-up river Bero, near Cavalheiros; fr. and few fl. August 1859. No. **2361**. An annual herb, a hand high, with several slender stems; flowers rosy, trichotomously corymbose. At the sandy banks of the river Bero; seeds July 1859. Coll. Carp. 581.

3. **N. andongensis** Welw. ex Hiern in Oliv. Fl. Trop. Afr. ii. p. 473; Koehne in Engl. Bot. Jahrb. iii. p. 328 (1882).

Pungo Andongo.—An annual bright-green herb, with the habit of a *Lythrum*; rhizome creeping; stem reddish, tetragonal; leaves herbaceous, subglaucescent to deep-green; calyx-lobes ciliate, patent at the time of flowering; petals 4, or rarely 3 or 2, of a deep-rose or reddish colour, with a rather long claw; stamens 4, sub-exserted; anthers yellow, with tumid almost globose-ovoid cells. In swampy stations near the cold springs on the higher parts of the gigantic volcanic rocks towards the eastern side of the *præsidium* of Pungo Andongo; fl. and fr. March 1857. No. **2367**. An erect or ascending, deep-green, annual herb; branches opposite; leaves minutely crustaceo-serrulate; flowers tetramerous, rosy; calyx urceolate-campanulate, 8-striate; lobes 4, broadly deltoid, acute, erect-connivent: cornua 4, longer than the calyx-lobes, erect-patent, at the apex ciliate with elongated rather rigid papillæ; petals 4, obovate-spathulate, longer than the calyx, rosy, very fugacious; capsule bursting irregularly. In marshy places with short herbage at the banks of the river Cuanza, near Sansamanda and Mopopo; fl. and fr. April 1857. No. **2368**.

4. **N. sarcophylla** Koehne, *l.c.*, p. 328 (1882).
Ammannia sarcophylla Welw. ex Hiern, *l.c.*, p. 479.

Mossamedes.—A rather fleshy annual herb, branched from the base; stems thick; branches prostrate or decumbent, here and there rooting at the nodes; leaves rather rigid, glaucescent, ovate-lanceolate, cordate-auriculate at the base; auricles rotundate-obtuse; flowers sessile. In moist sandy places near the banks of the river Bero, near Cavalheiros, a few specimens; in late fl. and fr. July and Sept. 1859. No. **2365**. Coll. Carp. 578, 579 (part) and 580. In a moist sandy spot near the river Bero then almost dried up, in company with *Marsilea diffusa* Lepricur; only one specimen gathered; fl. and fr. beginning of August 1859. No. **2373**.

5. **N. radicans** Guillem. & Perrott. Fl. Senegamb. (i.) p. 306 t. 70 (1833); Hiern, *l.c.*, p. 474; Koehne, *l.c.*, p. 330.

Mossamedes.—A slender decumbent herb of 2 to 4 ft.; leaves grass-green; flowers rosy; petals 2, or rarely 3 or 4. In one spongy place only, amidst sedges and reeds near the mouth of the river Giraul, in company with *Equisetum ramosissimum* Desf., and *Marsilea diffusa* Leprieur, var. β *cornuta* Baker; fl. 18 July 1859. No. **2330**. In a clayey-sandy moist place near the river Bero, between the mouth of this river and that of the river Giraul; only one specimen seen; fl. not yet fully open at the end of winter, August 1859. No. **2331**.

6. **N. floribunda** Sond. in Harv. & Sond. Fl. Cap. ii. p. 517 (1862); Hiern, *l.c.*, p. 474; Koehne, *l.c.*, p. 331.

Mossamedes.—In a sandy place with scanty herbage near the banks of the river Bero (or Rio das Mortes); only one plant seen; fl. at the end of winter, August 1859. No. **2329**.

7. **N. erecta** Guillem. & Perrott. Fl. Senegamb. (i.) p. 305, t. 69 (1833); Hiern, *l.c.*, p. 474; Koehne, *l.c.*, p. 331.

Mossamedes.—In sandy places with scanty herbage, near the banks of the river Bengo, Mata dos Carpenteiros; very few specimens seen; fl. 21 Sept. 1859. No. **2328**.

8. **N. cordata** Hiern in Oliv. Fl. Trop. Afr. ii. p. 475; Oliv. in Trans. Linn. Soc. xxix. p. 74, t. 40 B (1873); Koehne, *l.c.*, p. 332. *N. erecta* Thoms. in Speke, Journ., App. p. 634 (1863), non Guillem. & Perrott.

Pungo Andongo.—A remarkably elegant, annual, much branched herb; habit nearly that of Melastomaceæ; branches and branchlets opposite, gradually shortening towards the apex of the stems; leaves rather rough; flowers small, rosy, clustered, surrounded at the base by a cymbiform involucre. In marshy pastures and flooded spongy places, in company with minute species of *Eriocaulon* and Campanulaceæ, between Quisonde and Condo, very abundant; fl. and fr. March and beginning of April 1857. No. **2327**. In spongy places near Lombe in the neighbourhood of the river Cuanza; not yet fl. beginning of March 1857. No. **2327***b*. Near Muta Lucala; fl. and fr. March 1857. A narrow-leaved form. No. **2327***c*. An annual herb, 3 in. high, corymbosely branched, with a Melastomaceous habit. In marshy places near Lombe; fl. and fr. Coll. Carp. 585.

9. **N. linifolia** Welw. ex Hiern in Oliv. Fl. Trop. Afr. ii. p. 472; Koehne in Engl. Bot. Jahrb. iii. p. 335 (1882).

Huilla.—A slender undershrub, 6 in. high; rootstock woody, branched; stems several; leaves alternate, very rarely the lower ones opposite; peduncles axillary, elongated, 1- to 3-flowered; pedicels bracteolate; flowers rose-red, fine; calyx shortly campanulate, at length membranous, usually 8- or rarely 7- or 6-lobed; lobes deltoid, acute, erect, equal; cornua obsolete, represented by thickened folds in the sinuses between the calyx-lobes; petals 8 or 7, obovate, spathulate, shortly clawed, three times as long as the calyx, rosy, corrugated, fugacious, adnate to the inner side of the sinuses; stamens 16 or 14, inserted above the base of the calyx-tube; filaments elongated, filiform; anthers curved; ovary sessile; style elongated; stigma truncate, capitate; capsule ribbed, 1-celled, dehiscing from the middle to the apex

with 6 valves or folds, many-seeded. In shortly and sparingly bushy pastures, in rocky places sometimes flooded in summer, in company with *Machadoa huillensis* Welw. Herb. No. 865, *Ascolepis speciosa* Welw. No. 1674, and Thymelæaceæ, near Lopollo, at an elevation of 5000 ft.; fl. and fr. end of Nov., Dec. 1859 and Jan. 1860. No. **2332**. A perennial herb; rootstock woody, branched; stems erect, very slender, a foot high; leaves linear; flowers large, rosy. In hilly bushy places near Lopollo; fl. and fr. Dec. 1859. COLL. CARP. 583.

10. **N. passerinoides** Koehne, *l.c.*, p. 338.
Ammannia passerinoides Welw. ex Hiern, *l.c.*, p. 480.

HUILLA.—A strigulose-canescent plant, agreeing in habit with *Passerina*; branches virgate; leaves opposite or alternate, strict; flowers clustered 3 to 7 together in the axils of the leaves, unibracteolate at the base or the interior ones altogether ebracteolate; flowers constantly yellow; calyx membranous, tetragonal, 4-lobed; cornua 4, very small or almost obsolete; petals wanting or minute and yellow; stamens usually 4 exserted or 8 of which 4 are included; capsule apparently 1-celled, dehiscing in a circumsciss manner, not valvular or rarely with indications of 4 valves; seeds orbicular-subangular, convex on one face and concave on the other. At the swampy margins of the Lopollo stream, in company with *Zantedeschia hastata* (Welw. Herb. No. 232) and species of *Salix*, *Xyris*, and *Gladiolus*, at an elevation of 5500 ft.; fl. and fr. middle of March 1860. Specimens collected during a sally from the fortress, when two of Welwitsch's negroes were killed and five others escaped with him. No. **2336**.

11. **N. lythroides** Welw. ex Hiern in Oliv. Fl. Trop. Afr. ii. p. 471; Koehne in Engl. Bot. Jahrb. iii. p. 338 (1882).

MOSSAMEDES.—Habit of *Lythrum*. In a moist marshy thicket with lax herbage near Cavalheiros, in sandy-clayey places not unfrequently quite flooded, sparingly; fl. and fr. 21 Sept. 1859. No. **2335**. In moist sandy places with lax herbage, near Boca do Rio, at the banks of the river Bero; only one specimen seen; fl. August and beginning of Sept. 1859. Probably a young plant of this species. No. **2334**.

LVIII. ONAGRACEÆ.

Nearly all the species of this family hitherto discovered in Angola proper are herbaceous or suffrutescent, and belong to the genus *Jussiæa*; they inhabit swamps or meadows by the sides of rivers and streams, and gradually increase in abundance from the coast towards the uplands in the interior. The greater part of them are inconspicuous herbs, and present but little or none of the elegance and beauty of the American members of the family; but they are sufficiently curious and interesting to botanists, especially as commemorating the venerated name of the talented Antoine Laurent de Jussieu, the founder of the natural system. Tannic acid abounds in these plants and, mixed with the ferruginous particles which surround them on the banks of the rivers, produces a kind of black muddy deposit, which the Portuguese colonists call *lodo preto*, and which the natives use for the purpose of dyeing black various sorts of the fabric called *Mabéla*, made from the fibre of the *Raphia* palm. A specimen of this *lodo* is

contained in Coll. Carp. 1062, with the native name of "Malôa" attached. Apparently with reference to a similar deposit, Christian Smith in Tuckey, *Congo*, p. 301, speaks of the shore of the river as overgrown with a thick sod covered with a species of *Jussiæa*. An *Isnardia* and two species of *Epilobium* were found in the district of Huilla, and another *Isnardia* in Mossamedes.

1. **EPILOBIUM** L.; Benth. & Hook. f. Gen. Pl. i. p. 787.

1. **E. hirsutum**, L. Sp. Pl., edit. 1, p. 347 (1753); Oliv. Fl. Trop. Afr. ii. p. 487.

Huilla.—Stem 2½ to 4 ft. high: stigma 4-lobed, lobes broadly oblong, rather thick, erect-patent. Along the bushy banks of streams near Lopollo, in company with *Typha* (cf. Herb. No. 243), *Polygonum* (cf. Herb. No. 5363), *Rumex* (cf. Herb. No. 5357), *Rubus huillensis* (Welw. Herb. No. 1281), and *Jaumea* (Herb. No. 3965); fl. and fr. April and May 1859. No. **4457**.

2. **E. benguellense**, Welw. ms. in Herb.

Glabrescent, shining, and apparently perennial; stems annual, 2 to 3 ft. high, rooting at the very base, ascending below, erect above, glabrous, sparingly branched, cylindrical, sub-fistulose, leafy; leaves linear-lanceolate, narrowed towards both ends, obtusely pointed at the apex, glabrous, spreading, glaucous-green, minutely glandular-denticulate chiefly towards the apex on the margin (glands red or purplish), alternate or the lower ones opposite, 1 to 3½ in. long by ⅛ to ⅓ in. broad, attenuate at the base into a subglabrous broad obsoletely decurrent petiole of $\frac{1}{12}$ to ⅕ in.; nerves subpellucid; inflorescence centripetal; flowers axillary, regular, at first whitish, at length rose-coloured; peduncle about ½ in. long, clothed with short curly hairs; calyx-lobes lanceolate, ⅕ in. long, puberulous outside, hooded-apiculate; petals oval, obtuse, cleft at the apex, ¼ in. long, rose-coloured or palely so, veined; stamens all shorter than the petals; anthers oblong; stigma undivided; capsule slender, 1¼ to 1½ in. long; together with the peduncle 1½ to 2½ in. long; seeds unequally ovoid-oblong, about $\frac{1}{24}$ in. long, obtuse at the apex below the sordid comose crown, bluntly and obliquely pointed at the base, glabrous not shining nor tuberculate.

Huilla.—In swampy thickets along the banks of the river Monino, not abundant; fl. and fr. Feb. 1860. No. **4458**. In marshy places near the banks of the river Caculuvar along the road leading to Quilengues: fl. and fr. end of Feb. 1860. No. **4459**.

Nearly allied to *E. stereophyllum* Fresen., of Abyssinia, but differs by its leaves being more distinctly petiolate and attenuate at the base, etc.

2. **JUSSIÆA** L.; Benth and Hook. f. Gen. Pl. i. p. 788.

1. **J. erecta** L. Sp. Pl., edit. 1, p. 388 (1753) part, non L. Pl. Surin. n. 52 (1775); M. Micheli, Onagr. Brésil, p. 15 (1874).

J. altissima Perrottet ex DC. Prodr. iii. p. 55 (1828). *J. linifolia* Oliv. Fl. Trop. Afr. ii. p. 489; non Vahl.

Loanda.—An erect herb; stem 3 to 7 ft. high, of a blood-red or

purplish colour, an inch in diameter at the base, very narrowly winged and angular by the decurrence of the leaves; branchlets swelled at their origin; leaves elliptic-lanceolate, very shortly petiolate, base with two red glands; flowers yellow; calyx-lobes with red glands at the base; petals ovate, rather obtuse, very fugitive. In moist places by the road to Quicuxe; fl. and fr. end of March 1858. No. **4621.**

Libongo.—An annual, erect herb, 1 to 1½ ft. high, sparingly branched; leaves yellow, rather small for the genus. In swamps about lakes on the left bank of the river Lifune, in company with *Hydrocotyle asiatica* L. (Welwitsch Herb. 620) and *Azolla pinnata* Br. (Welwitsch Herb No. 37); fl. and fr. end of Sept. 1858. No. **4460.**

Mossamedes.—At the banks of the river Bero, near Cavalheiros; fl. and fr. end of June 1859. No. **4473.** Annual herb, 1 to 2½ ft. high, erect; abundant in moist sandy places along the banks of the river Bero; fl. and fr. July 1859. No. **4474.** Flowers yellow; abundant in moist sandy places along the banks of the river Bero, but not descending to the mouth of the river; fl. and fr. July 1859. No. **4476.**

2. **J. linifolia** Vahl, Eclog. Amer. ii. p. 32 (1798); M. Micheli, pp. 17, 20 (1874); non Oliv. Fl. Trop. Afr. ii. p. 489.

J. acuminata Benth. in Hook. Niger Fl. p. 343 (1849); C. Wright in Journ. Linn. Soc. x. p. 478 (1869); Oliv., *l.c.*, p. 489; non Swartz.

Mossamedes.—An annual, patently branched herb, a foot high; bloodred-purple throughout except the yellow petals; stem leaves and calyx rather fleshy. In damp sandy places at the mouth of the river Bero, rather rare; fl. and young fr. beginning of August 1859. No. **4478.**

3. **J. pilosa** H. B. & K. Nov. Gen. vi. p. 101, t. 532*a* (1823); Oliv., *l.c.*, p. 488; M. Micheli, *l.c.*, pp. 17, 20.

Barra do Bengo.—A herb, almost shrubby, branched from the base; branches ascending, elongated; flowers yellow. At the swampy edges of the Lagôa de Foto, in company with *Pistia Stratiotes* L.; fl. and fr. Sept. 1857. No. **4463.**

4. **J. repens** L. Sp. Pl. edit. i. p. 388 (1753); C. Martins, Mém. Juss. p. 22, tt. 1-4 (1866); M. Micheli, *l.c.*, pp. 18, 21.

J. diffusa Forsk. Fl. Ægypt-Arab. p. 210 (1775); Oliv. Fl. Trop. Afr. ii. p. 488.

Barra do Dande and Libongo.—An apparently perennial herb, growing by the edges of lakes and pools, sometimes prostrate and creeping with long stolons rooting at the nodes, at other times floating and stellate after the manner of *Utricularia stellaris* L.; branches 4 to 10 ft. long, smooth, purple, more or less straight, forming floating meadows; leaves rather shining; corpuscula stellately arranged around the nodes of the stem, linear-elliptical, spongy, soft, of a very bright rose-colour in the living state; flowers yellow (observed only on the terrestrial form), rather large for the genus; peduncles 1 to 1½ in. long, as well as the tube of the calyx woolly-hirsute. In swamps by lakes along the banks of the rivers Lifune and Dande, especially floating on the lake near Bombo; fl. Sept. 1858. No. **4465.**

Pungo Andongo.—In pools near Sansamanda, near the river Cuanza, in company with *Aponogeton leptostachys* E. Mey., sparingly; fl. May 1857. No. **4466.** A decumbent, stoloniferous, little herb, apparently

perennial, with the habit of a *Ludwigia* or *Isnardia*; branches ascending; flowers of a fine yellow colour; stamens 10. In spongy swamps on the right bank of the river Lombe, conspicuously decorating wide tracts of marshes with its golden flowers; fl. and fr. March 1857. No. **4471**. Flowers yellow. In spongy places within the fortified lines of Pungo Andongo. Only one specimen, gathered in May 1857. No. **4471***b*.

Mossamedes.—Stems branched at the base, elongated, ascending; petals large, yellow, less fugitive than in the other species. In swamps about the river Giraul, very abundant; fl. 19 July 1859. No. **4477**.

5. **J. suffruticosa** L. Sp. Pl. edit. 1, p. 388 (1753); M. Micheli Onagr. Brésil, p. 23.

J. angustifolia Lam. Encycl. Méth. iii. p. 331 (1789) and Ill. Gen. ii. p. 422, t. 280, f. 3 (1793). *J. villosa* Lam., *l.c.*, p. 331; Oliv. Fl. Trop. Afr. ii. p. 489. *J. linearis* Willd. Sp. Pl. ii. p. 575 (1799). *Jussiæa* spec., Welw. Apont. p. 589, n. 76.

Loanda.—An undershrub, 2½ to 4½ ft. high; stem erect or ascending, purplish, patently branched in the upper half; flowers yellow, tetramerous, of moderate size for the genus. In damp places by stagnant water, Museque de Luiz Gomes, abundant; fl. and fr. August 1856. No. **4461**. A patently branched undershrub, annual and biennial, 2 to 4 ft. high; leaves narrow; flowers yellow, of moderate size. In moist places, near Museque de Luiz Gomes; fr. August 1858. Coll. Carp. 589.

Barra do Bengo.—An undershrub, 2 to 4 ft. high; stem ascending, hirsute, leafy; flowers yellow. By pools near Quifandongo; fr. June 1857. Coll. Carp. 588.

Icolo e Bengo.—An annual herb; stem ascending or oblique, rarely straight, usually branched from the base; flowers small, yellow. At the swampy margins of lakes near Funda, not uncommon; fl. and fr. Sept. 1857. No. **4620**.

Libongo.—An erect, slender, sparingly branched herb, with small, yellowish flowers. In marshy places at the banks of the river Lifune, near Banza de Libongo; fl. and fr. Sept. 1858. No. **4468**. A herb, apparently annual; stems very long, prostrate, purple, almost distichously branched, sarmentose; branchlets shaggy, densely leafy, ascending. In swamps about drying-up pools on the left bank of the river Lifune, in company with *Azolla*, etc.; without either fl. or fr. end of Sept. 1858. Probably a state of this species. No. **4481**.

Golungo Alto.—A bush; fl. and fr. No. **4467**. Herbaceous; stem erect, red, shaggy, branched; leaves linear-lanceolate; flowers yellow; petals very caducous. In damp places by the river Cuango; fr. March 1856. Coll. Carp. 587. In marshy places by streams, near Canaûlo; fl. and fr. April 1856. No. **4462**.

Pungo Andongo.—An erect herb, 5 ft. high, with spreading branches and yellow flowers. By swamps along the banks of the river Cuanza, near Candumba; fl. and fr. Jan. 1857. No. **4469**.

Mossamedes.—A herb, either 1½ to 2 ft. high and nearly unbranched, or ranging up to 4 ft. and much branched, reddish almost throughout except the yellow flowers. By the bushy margins of the river Bero; fl. and fr. July and August 1859. A glabrous form. No. **4475**.

The two following Nos. appear to belong to this species or to be near it:—

Pungo Andongo.—At Calunda Mangue; fl. and fr. March 1857.

No. **4470**. A prostrate annual herb; stem purplish; leaves bright green; flowers deep yellow. Abundant in rice fields by the rivulet Miége near Caghuy; fl. and fr. end of Feb. 1857. No. **4472**.

3. **ISNARDIA** L. Gen. Pl., edit. 1, p. 337 (*init. anni* 1737). *Ludwigia* L. Cor. Gen. p. 3 (Oct. 1737); Benth. & Hook. Gen. Pl. i. p. 788.

1. **I. palustris** L. Sp. Pl. edit. 1, p. 120 (1753).

Isnardia (sp.) Welw. in Journ. Linn. Soc. v. p. 187 (1861).

Huilla.—At the banks of the Lopollo river; fr. Nov. 1859. No. **4480**.

2. **I. prostrata** O. Kuntze, Rev. Gen. Pl. i. p. 250 (1891).

Ludwigia prostrata Roxb. Hort. Beng. p. 11 (1814); Oliv. Fl. Trop. Afr. ii. p. 491.

Golungo Alto.—An undershrub, 6 to 7 ft. high, very much branched. At the banks of the river Quiapoze; fl. and fr. Dec. 1854. No. **4464**.

Mossamedes.—An annual herb, branched from the base; stems ascending; flowers small, yellowish, tetrandrous. In sandy damp herbaceous places at the banks of the river Bero, near Cavalheiros, rather rare; fl. and fr. in winter, July 1859. No. **4479**.

Our specimens agree fairly with this species, except that in No. 4464 the capsules range from ¾ to 1½ in. in length.

LIX. SAMYDACEÆ.

1. **HOMALIUM** Jacq.; Benth. & Hook. f. Gen. Pl. i. p. 800.

1. **H. stipulaceum** Welw. ex Masters in Oliv. Fl. Trop. Afr. ii. p. 498.

Golungo Alto.—An evergreen tree of 15 to 30 ft. in height, or after the burning of the forests a shrub of 3 to 5 ft., and even at that size flowering; distinguished by very large foliaceous stipules, 1 to 1½ in. long by 1 in. broad, and by the margins of the lamina revolute throughout; fruit not seen. In the more elevated primitive forests near Sange, at the springs of Capopa, also at the base of Serra de Alto Queta, not uncommon; fl. Jan. 1856. No. **2495**.

See Welw. Apont. p. 556 n. 126.

2. **H. africanum** Benth. in Journ. Linn. Soc. iv. p. 35 (1859); Masters, *l.c.*, p. 497; Henriques in Bol. Soc. Brot. x. p. 119 (1892).

Island of St. Thomas.—Dec. 1860. Called "Quebra machado." No. **6756**.

LX. TURNERACEÆ.

1. **WORMSKIOLDIA** Thonn.; Benth. & Hook. f. Gen. Pl. i. p. 807.

1. **W. lobata** Urb. in Eichl. & Garcke, Jahrb. Bot. Berl. ii. p. 52 (1883); Gilg in Engl. & Prantl, Nat. Pflanzenfam. iii. 6*a*, p. 61 (1893).

W. heterophylla Welw. Apont. p. 555 sub n. 124 (*Tricliceras raphanoides*), non Thonn.

GOLUNGO ALTO.—In exposed sunny places, on a clay soil, covered with short grass, near Cambondo, rather frequently: fl. and fr. 30 Jan. and Feb. 1855. No. **2493** (in part).

CAZENGO.—In open places among short herbage, on the left bank of the river Luinha, along the base of Serra de Muxaula, at an elevation of 2000 ft., occasionally; fl. and fr. 10 June 1855. No. **2493** (in part). COLL. CARP. 591. An erect annual herb with yellow flowers. In rather dry hilly places by the river Luinha; fl. and fr. Dec. 1854. COLL. CARP. 590.

PUNGO ANDONGO.—In sandy pastures among low bushes, in places flooded in the rainy season, near Candumba; also between Caghuy and Sansamanda, frequently; fl. and fr. Dec. 1856 and March 1857. No. **2494**.

LXI. PASSIFLOREÆ.

This natural order in Angola does not exhibit the brilliancy and beauty of the flowers of the American species, but rather resembles the Cucurbitaceæ (*Bryonia*), and is chiefly represented by the genus *Adenia*; one of them, *A. lobata* Engl., furnishes an edible fruit and also supplies an anthelmintic decoction. Most of the species are erect herbs or tall shrubs. A species of *Ophiocaulon* bears fruits as large as a pigeon's egg, which are eaten raw or used for making lemonade. Welwitsch was convinced that the genera or subgenera found in the interior of Natal, such as *Tryphostemma*, etc., are also to be found in the interior of Mossamedes.

1. **BASANANTHE** Peyr.; Benth. & Hook. f. Gen. Pl. i. p. 812; Welw. Sert. Angol. p. 27.

1. **B. nummularia** Welw. Sert. Angol. p. 28, tab. 9 (1869); Masters in Oliv. Fl. Trop. Afr. ii. p. 509.

Tryphostemma nummularium Engl. Bot. Jahrb. xiv. p. 388(1892).

HUILLA.—An erect herbaceous perennial plant, 3 to 5 in. high, remarkably resembling some violets; corolla white, pentamerous, with a corona. In rather moist sandy thickets about Lopollo; fl. and fr. Jan. and Feb. 1860, between 5200 and 5600 ft. alt., in company with *Triumfetta geoides* Welw. No. **871**.

2. **B. littoralis** Peyritsch in Mohl & Schlecht. Bot. Zeit. xvii. (1859) p. 101; Welw. Sert. Angol. p. 28 (*litoralis*); Masters, *l.c.*

Tryphostemma littorale Engl. Bot. Jahrb. xiv. p. 388 (1891).

BENGUELLA.—An undershrub or perennial herb, 2 ft. high; branches numerous, decumbent at the base, ascending, slender, somewhat woody; leaves lanceolate-linear; calyx green; petals white, very tender, spreading in a star, fugacious, not abundant. In sandy maritime thickets between the city of Benguella and the river Catumbella, especially near the right bank of the stream (then dried up) Cavado or Maribondo; fl. and young fr. middle of June 1859. No. **872**.

Engler in his Bot. Jahrb. xiv. p. 388 (1891), and Harms in Engl. & Prantl, Nat. Pflanzenfam. iii. 6*a*, pp. 80, 81 (1893), treat *Basananthe* as a section of *Tryphostemma* Harv.; the former genus, however, dates from 18 March 1859, while the latter was not published before the latter part of the same year.

2. **PAROPSIA** Noronh.; Benth. & Hook. f. Gen. Pl. i. 812.

1. **P. grewioides** Welw. ex Masters in Oliv.Fl.Trop.Afr. ii. p. 505.

Golungo Alto.—An arborescent shrub or a small tree, 8 to 12 ft. high, or even exceeding 25 ft., with a broad leafy head and the habit of a *Grewia*; branches and branchlets erect or erect-patent, slender, leafy, the younger ones rufous-tomentose; leaves evergreen, subcoriaceous, rather rigid and glossy on both surfaces, yellowish-green, slightly paler beneath, emerging from two fugacious stipules: calyx fuscous- or cinnamon-tomentose, 5-partite; segments valvate from the base to the middle, imbricate towards the apex, covered on the inner surface with yellowish-red tomentum; petals from a pale colour turning dark yellow, rather fleshy, less densely velvety than the sepals. Between the petals and stamens there are placed 10 staminodes, rather long, rigid, truncate, fuscous-tomentose, of which the 5 alternate ones are much narrower than the rest. Stamens 5, inserted between the staminodes and the base of the ovary, flattened at the base and gradually narrowed upwards, dark-red; anthers cordate-sagittate, of a whitish rose colour or almost red, 2-celled, introrsely dehiscing longitudinally. Ovary ovoid, subsessile, densely fuscous-tomentose, 1-celled; ovules several; placentas 3, parietal; styles 3, divaricate; stigmas cordate-obtuse, white or whitish, hirsute on the back; capsule an inch long, pedunculate, axillary, obovoid-clavate when not quite ripe, green outside and beset with fuscous rigid readily caducous pilose hairs, surrounded at the base with the remains of the calyx and corolla, obtusely umbonate at the apex, 1-celled, 3-valved. Seeds horizontal, with a sufficiently long funicle, rather large, about 18 to 24, covered with whitish viscid membranous aril. In the loftier primitive forests of Serra de Alto Queta; fl. beginning of Jan. 1856, sparingly in fr. 17 March 1856, and ripe fr. April 1856. No. **873**.

The following specimen in the carpological collection seems to belong here:—

Golungo Alto.—A subarborescent shrub, standing erect; capsules obovoid, rather more than an inch long; seeds ¼ by ⅛ in. when dry. Coll. Carp. 593.

3. **ADENIA** Forsk. Fl. Ægypt.-Arab. p. 77 (1775).

Modecca Lam. (1797); Benth. & Hook. f. Gen. Pl. i. p. 813.

1. **A. Welwitschii** Engl. Bot. Jahrb. xiv. p. 375 (1892).
Modecca Welwitschii Masters in Oliv. Fl. Trop. Afr. ii. p. 513.

Pungo Andongo.—A climbing glaucous undershrub; leaves palmately 5-lobed, with the middle lobe usually trifid; petiole biglandular at the apex, furnished at the base on each side with a small lanceolate nearly free stipule; flowers axillary, unisexual, apparently strictly dicœcious, orange-red, nodding, nearly an inch long. Of the male flowers calyx exinvolucrate, cyathiform, with a rather long gradually widened tube, and limb cleft into 5 broadly lanceolate lobes spreading at the time of flowering; petals 5, lanceolate, greenish, inserted at the middle of the calyx-tube, reaching somewhat higher than the base of the calyx-lobes, alternating with the calyx-lobes, corona annular, consisting of short very slender erect fringes; stamens 5, springing from the bottom of the calyx, a little higher than the petals, subexserted; filaments connate into a tube up to the middle, and then free, flattened, opposite to the calyx-lobes; anthers attached to the filaments at their

basal sinus, erect, lanceolate-linear, subcordate at the base, with lateral cells, that is, neither clearly introrse nor clearly extrorse ; ovary none. In shaded places, at the borders of the forests (Mata de Pungo) of the fortress of Pungo Andongo, rare and very sporadic ; fl. Jan., and sparingly fr. March and May 1857. No. **864**.

2. **A. trisecta** Engl., *l.c.*, p. 375.
Modecca trisecta Masters, *l.c.*, p. 514.

Pungo Andongo.—A perennial climbing herb, with a thick root-stock and Cucurbitaceous habit ; male flowers yellow, nodding ; fruit sub-globose, orange-coloured, glabrous, smooth, 1½ in. in diameter in the dry state, like a small pumpkin. In sandy wooded places, between Zamba and Cazella, on the left bank of the river Lutete, very sparingly : male fl. and fr. Oct. 1856. No. **863**.

3. **A. lobata** Engl., *l.c.*, p. 375.
M. lobata Jacq. Fragm. p. 82, t. 131 (1809) ; Masters, *l.c.*, p. 516.
Var. **elegans** (Masters, *l.c.*, p. 517; Ficalho, Pl. Uteis, p. 185 (1884)).

Golungo Alto.—A stout shrub, climbing to a great height, not uncommonly 40 ft. or higher ; adult stem 1 in. in diameter, trigonous, angles tubercular-crested throughout, greenish-purple ; branches and branchlets cylindrical. Male flowers greenish-yellow, when fully expanded exactly campanulate, of a brighter yellowish colour within. Petals rhomboid-spathulate, with a long claw and the margin of the limb ciliate-fringed, alternating with the calyx-lobes, inserted on the margin of the corona, and joining a broad membrane between each petal and the anther-bearing disk, erect ; glands 5, large, lamelliform, spreading, revolute in the bud ; stamens 5, with anthers subulate at the apex, and there without pollen ; rudiment of the stigma fusiform. At the edges of the primitive forests of Sobato de Bumba ; fl. Nov. 1855. No. **870**.

The following specimens in the carpological collection seem to belong here :—

Cazengo.—A climbing shrub ; fruit yellow, turning orange, acid-sweetish, used for lemonade. In woods by the river Luinha, July 1856. Coll. Carp. 596. A stout shrub climbing to the height of 80 ft. Fruit capsular, as big as a pigeon's egg, yellow outside, with an agreeable acid pulp. Near the river Luinha, July 1857. Coll. Carp. 597.

Golungo Alto.—Sange, March 1856. Coll. Carp. 595. A very tall-climbing shrub, with edible fruit. Native name "Mobiro." Coll. Carp. 953. This connects the plant with Welw. Synopse Explic. p. 55, n. 146 (Stems of Mobiro.—"Mobiro" or "Mobilo" or "Muvilo" is an arborescent climber of the family of Passifloreæ and of the genus *Adenia*, which grows abundantly in the primitive forests of Cazengo, Golungo Alto, and Dembos, and of which the ovoid yellow fruit of the size of a pigeon's egg produces an excellent lemonade. A decoction of the leaves or stems is known to the native doctors as one of the best anthelmintic remedies, especially when mixed with the rind of the root of Mubango, *Croton Mubango* Müll. Arg., Welw. Herb. No. 348). It is also used in cases of nervous or rheumatic headaches, etc., and is known in Golungo Alto by the name of "Cunnungando" (Paó cobra).

Another form of the native name is Mŭbīrŏ. The fruit is eaten, and resembles that of a small *Passiflora*; in Cazengo a decoction of the stems is used in cases of neuralgia of the head, just as in India a species of the genus is employed for the same purpose.

The following Nos. appear also to belong to *Adenia* :—

Golungo Alto and Cazengo.—A glaucous tall-climbing herb, with soft leaves, rather tender, membranous or a little fleshy, very quickly becoming flaccid, very dark-green, variegated with pale-green spots ; by the banks of the river Cuango, near the cataract of Sange, in shaded forests ; without fl. Dec. 1855 and Feb. 1856. Also in Serra de Muxaula ; without fl. June 1855. Cf. *A. Welwitschii* Engl. Nos. **795** and **795***b*.

Golungo Alto.—A glaucous, widely climbing herb ; flowers greenish-white, small ; fruit as large as a hazel-nut, greenish when ripe ; leaves very glaucous, with the blade marked with whitish spots, and below pallid ; in thickets in Sobato de Mussengue ; fr. March 1857. Coll. Carp. 137. Fruit ovoid, turning bluish, as large as a walnut ; in thickets and also in the densest forests of Quilombo ; fr. Feb. Coll. Carp. 598.

4. **OPHIOCAULON** Hook. f. in Benth. & Hook. f. Gen. Pl. i. p. 813.

1. **O. cissampeloides** Masters in Oliv. Fl. Trop. Afr. ii. p. 518.

Golungo Alto.—A shrub or undershrub widely climbing, 3 to 4 ft. high or more, herbaceous above, hard-woody below, wholly glaucous ; flowers rather fleshy, greenish. In the very dense primitive forests of Sobato de Bumba, not uncommon, but rarely flowering ; fl. from Jan. to May 1856. No. **866**. A tall climber, shrubby ; leaves juicy-membranous, deep green and spotted with white above, glaucous below ; flowers yellow-greenish. Not seen in fruit in this district. Not uncommon in the denser shaded and moist palm groves about Sange ; fl. March 1856, and not yet fl. Jan. 1856. No. **868**.

Pungo Andongo.—In the primitive forest of Mata de Quilanga, near Pungo Andongo; only one specimen; fr. end of May 1857. No. **867**.

2. **O. cynanchifolium** Masters, *l.c.*, p. 519 (*cynanchifolius*).

Golungo Alto.—A climbing herb, somewhat shrubby at the base ; lower leaves 3-lobed. In the denser forests on the eastern side of Serra de Alto Queta, Zenza do Queta ; a young plant not yet in fl. May and June 1856. No. **869**. Stems with leaves but without flowers, in rather shaded and wooded stations, among the mountains of Serra de Alto Queta, Dec. 1855. No. **869***b*. A climbing herb, apparently annual ; climbing on palms in woods near the river Cuango, at Cacarambola ; leafy branches, Jan. 1856. No. **869***c*.

The specimen under this No. in Herb. Kew. appears to belong to a different species, namely, **O. gummiferum** Mast., *l.c.*, p. 518 (*gummifer*), which is perhaps only a variety of *O. cissampeloides*.

5. **MACHADOA** Welw. ex Benth. & Hook. f. Gen. Pl. i. p. 814.

1. **M. huillensis** Welw. Sert. Angol. p. 29, tab. x. (1869) ; Masters in Oliv. Fl. Trop. Afr. ii. p. 520.

Huilla.—In hilly and rather dry stations, stony and with short bushes, at an elevation of about 5000 ft., in company with *Nesæa linifolia* Welw. and with species of Thymelæaceæ and Iridaceæ, near Lopollo ; seen only in one spot ; fl. and young fr. Dec. 1859. No. **865**. Root napiform, not milky ; capsules many-seeded, 1½ in. long (in the dry state) ; placentas parietal ; seeds as in some species of *Passiflora* ; leaves linear-lanceolate, 4 to 5 in. long, somewhat fleshy ; flowers sub-lateral. In sandy thickets near Lopollo ; very rare. Coll. Carp. 599.

6. **PASSIFLORA** L.; Benth. & Hook. f. Gen. Pl. i. p. 810.

1. **P. edulis** Sims, Bot. Mag. tab. 1989 (1818).

Mossamedes.—Cultivated under the name of "Maracuja roxo" of St. Helena, whence it is supposed to have been imported; fruit of the size of a pigeon's egg ($\frac{2}{3}$ by $\frac{1}{2}$ in. when dry), containing a very sweet pulp. It serves to furnish an excellent lemonade for use in fevers, etc. Determination doubtful. Coll. Carp. 594.

2. **P. quadrangularis** L. Syst. Nat., edit. 10 (ii.) p. 1248 (1759).

Island of St. Thomas.—Called "Maracuja"; fr. Dec. 1860. Coll. Carp. 954.

Prince's Island.—Called "Grenadilla"; fr. Sept. 1853. Coll. Carp. 592.

This species is cultivated in the islands above-mentioned for the sake of its fruits, which Welwitsch found agreeable, sweet, and rather acid; they are egg-shaped and as large as a man's fist, and deserve to be cultivated throughout Angola.

Both of these species of *Passiflora* are of tropical American origin. According to a manuscript note of Welwitsch, *P. macrocarpa* Masters in *Gardeners' Chronicle*, 1869, p. 1012, occurs as a cultivated plant in Angola.

LXII. CARICACEÆ.

1. **CARICA** L.; Benth. & Hook. f. Gen. Pl. i. p. 815.

1. **C. Papaya** L. Sp. Pl., edit. 1, p. 1036 (1753); Welw. Apont. p. 556, n. 128. *Papaya vulgaris* DC. in Lam. Encycl. Méth. v. p. 2 (1804); Ficalho, Pl. Uteis, p, 185 (1884).

Golungo Alto.—In secondary woods and in thickets about the sites of deserted dwellings. Cultivated and subspontaneous. At Sange; fl. Jan. 1855. No. 802.

This is a beautiful tree, and has a very peculiar appearance, with its erect and undivided trunk, large leaves grouped in a terminal fascicle, and pendulous fruits of the size of a small melon; it is of American origin, and is one of the plants which the Portuguese have distributed in the tropics and introduced for cultivation in Africa and Asia. It is fairly frequent in Angola and the Cape de Verde Islands. The tree is called by the Portuguese colonists "Mamoeiro" and the fruit "Mamão" or sometimes "Papaya"; the fruit is eaten raw when ripe or dressed when unripe and cooked in many ways for the table, and eaten with cream or pepper or sugar as confectionery, or as sauce; and it is of true economic importance in some of the Portuguese colonies, as, for instance, in St. Antonio, Cape de Verde Islands, where it enters largely into the food of the island. The tree is frequent throughout the mountain region of Angola, both cultivated and wild, and produces fruit nearly all the year; but it is rarely met with either in the coast or highland regions, and it does not grow wild there; it is found in the warmer districts, in Icolo e Bengo, Cazengo, Golungo Alto, Cambambe, Benguella, etc. Welwitsch first saw it wild in secondary woods at Mongolo, not far from the river Chixe, in Oct. 1854. The trunk attains 10 to 20 ft. in height and then branches; beside its culinary uses the fruit has medicinal qualities. In a favourable climate it bears fruit at the end of the second year, but ordinarily not until the third or fourth year; it is met with both as monœcious and dicœcious; the trunk occasionally branches especially when mutilated near the top.

LXIII. CUCURBITACEÆ.

The Cucurbitaceæ produce a great feature of vegetation in the primitive forests both by the very varied forms of their foliage and particularly by the beauty and brilliant colours of their fruits; the mountainous region abounds in very fine species. The bastard colocynth, *Adenopus breviflorus* Benth., is abundant in all the forests in the same region; a species of *Trochomeria*, which is called by the negroes "Bumba-Riachole," furnishes in its turnip-like root an efficacious remedy against the attacks of quinsy; and *Cucumis chrysocomus* Schum. ornaments the sea-shore with its handsome golden fruit. Cucumbers, melons, water-melons, bottle-gourds, and common gourds, and their varieties are cultivated in all the regions of Angola, although at times with but little satisfactory results. *Lagenaria vulgaris* Ser., the Colombro of the Portuguese, the fruit of which is called "Binda" by the natives, grows wild in many damp situations in the coast and mountainous regions. *Sechium edule* Sw., the "chocho" of the West Indies, was recommended by Welwitsch as well worth introducing into Angola and cultivating for the sake of its well-flavoured fruit; it is subspontaneous in the African island of St. Thomas, where it is called "Pimpinella" (Welwitsch, Apont. p. 556, n. 129).

1. **TELFAIRIA** Hook.; Benth. & Hook. f. Gen. Pl. i. p. 821.

1. **T. pedata** Hook. in Bot. Mag. tt. 2751, 2752 (1 July 1827); Hook. f. in Oliv. Fl. Trop. Afr. ii. p. 523; Cogniaux in DC. Monogr. Phan. iii. p. 350 (1881).

Joliffea africana Bojer ex Hook., *l.c.*, Boj. ex. Raff. Delile in Mém. Soc. Hist. Nat. Paris iii. p. 318, t. 6 (July 1827) (*Joliffia*).

Mozambique Coast.—A shrubby climber; fruit immense, 2 to 3 ft. long, 6 to 8 in. thick, containing very tasty large seeds, which the Portuguese colonists call "castanhas de Inhambane." The negroes of Mozambique call the plant "cuémé" or "kouémé," and Welwitsch recommended its introduction into Angola. Dec. 1861. Coll. Carp. 600.

2. **T. occidentalis** Hook. f., *l.c.*, p. 524; Cogn., *l.c.*, p. 351.

Sierra Leone.—A herb, climbing far and widely; leaves trifoliolate; corolla from whitish to sordid-purplish. Along fences composed of some shrubby leafless *Euphorbia*, near Freetown, not uncommon; fl. at the time of the great rains, Sept. 1853. No. **823**.

2. **TROCHOMERIA** Hook. f. in Benth. & Hook. f. Gen. Pl. i. p. 822. *Heterosicyos* Welw. ex. Hook. f., *l.c.*

1. **T. vitifolia** Hook. f. in Oliv. Fl. Trop. Afr. ii. p. 525; Cogn., *l.c.*, p. 396; Ficalho, Pl. Uteis, p. 186 (1884).

Golungo Alto.—In the drier exposed bushy rocky situations at the base of the mountains of Serra de Alto Queta, sparingly and sporadic: male fl. March 1856; fr. Oct. No. **793**. A herb, grass-green throughout inclusive even of the flowers; producing every year from the very large underground or half underground tuber slender subvoluble tendrilled sparingly leafy runners, 4 to 7 ft. long; flowers mostly male;

calyx tubular, at the base including the abortive ovary ; corolla-lobes 5, lanceolate-linear, very acuminate, reflexed at the time of flowering, longer than the calyx-tube ; stamens 3, arising from the middle of the calyx-tube ; anthers straight, oblong-ellipsoidal, vertically approximated at the bare back ; connective produced at the apex, blackish-glandular ; ovary rudimentary, elongate-ovoid, shortly 3-lobed at the apex ; lobes apparently stigmatose. In open dry bushy places among the mountains of the Eastern Queta ; at Carengue : male fl. 19 Sept. 1856. Native name "Bumba Riachole." No. **793***b*. A dœcious plant, flowering sometimes without the leaves, at other times with the leaves, remarkably polymorphous ; rootstock napiform, half subterranean, when fully developed as large as a child's head, in high repute among the negroes as an excellent remedy in the form of a powder in cases of the disease called by them Ribebo, that is, a form of quinsy or carbuncle. On rocky slopes among low bushes at the base of Serra de Alto Queta near the river Luinha, sporadic nearly throughout the district, but become scarce on account of the tubers being eagerly searched for by the negroes ; female fl. April to Aug., fr. Sept. 1855. Native name "Bumbo-Riaxole." No. **793***c*. In an open stony mountainous place among grasses and low shrubs, near Sange ; very rare, only one specimen seen, female fl. and young fr. April 1856. Called "Bumba Riachole." No. **798**.

This is the plant referred to by Welw. Apont. p. 556 under n. 129, as belonging to a near genus. It occurs also, but not abundantly, in the district of Ambaca and at the Milongo country.

2. **T. macrocarpa** Hook. f., *l.c.*, p. 524 ; Cogn., *l.c.*, p. 398.

Var. **bracteata** Cogn., *l.c.*, p. 399.

Golungo Alto.—Climbing amid very tall grasses ; leaves bright-green, comparatively fleshy ; male flowers greenish. In rough mountainous situations, with tall bushes, near Camilungo ; only one specimen in male fl. seen in April 1856 ; female plant searched for without success, but in June a tuber found which had been got by the negroes at the same locality. No. **794**.

This is the plant mentioned by Hooker, *l.c.*, p. 525, as differing from the type of this species.

Pungo Andongo.—Whole plant bright-green, partly climbing, sometimes decumbent ; rootstock tuberous ; young fruit greenish or somewhat yellowish. In the more open thickets of the fortress of Pungo Andongo, very scarce ; young fr. March 1857. No. **797**.

Var. **Welwitschii** Cogn., *l.c.*, p. 399 ; Ficalho, Pl. Uteis, p. 186 (1884).

Pungo Andongo.—Rootstock perennial, napiform, with drastic qualities, stems very slender, elongated, scandent or decumbent ; leaves bright-green ; flowers yellow-greenish. In rather dry wooded places between the river Lutete and the fortress of Pungo Andongo ; only one specimen seen, with male fl., Oct. 1856. Native name "Bumba Ria Chala." No. **796**.

3. **T. polymorpha** Cogn., *l.c.*, p. 401.

Heterosicyos polymorpha Welw. in Trans. Linn. Soc. xxvii. p. 34 (1869) ; Hook f. in Oliv. Fl. Trop. Afr. ii. p. 526.

Huilla.—Seeds in some cases bisulcate on one side and trisulcate on the other. On exposed rocky hills amidst short bushes, near Lopollo, at an elevation of 5000 ft., very sparingly, in company with Irideæ and

three species of *Gnidia*, also with the next species ; fl. and fr., Nov. and Dec. 1859. No. **804**.

4. **T. stenoloba** Cogn., *l.c.*, p. 402.

Heterosicyos stenoloba Welw., *l.c.*, p. 34, Hook. f., *l.c.*, p. 526.

HUILLA.—Corolla wine-yellow. On exposed rocky hills amidst short bushes, near Lopollo, at an elevation of 5000 ft., only a few specimens seen, in company with the last species and with species of *Gnidia* and Euphorbiaceæ ; male fl. Nov. and Dec. 1859. No. **805**.

3. **PEPONIA** Naud. ; Benth. & Hook. f. Gen. Pl. i. p. 823.

1. **P. lagenarioides** Hook. f. in Oliv. Fl. Trop. Afr. ii. p. 527 ; Cogn. in DC. Monogr. Phan. iii. p. 408 (1881).

HUILLA.—A prostrate or decumbent annual or biennial herb, with the habit of *Lagenaria vulgaris* Ser. ; stem angular ; leaves large, reniform, sub-lobed, denticulate, softly flaccid ; petiole without a gland, peduncles very long ; flowers whitish-yellow or white, monœcious ; 1 to 1½ in. long ; stamens triadelphous ; young fruit oblong-ellipsoidal ; nearly ripe fruit oblong-cylindrical, 2 to 4 in. long, 1 to 1½ in. in transverse diameter, smooth, slightly ribbed longitudinally, from orange to scarlet outside ; flesh like that of cucumber in smell ; seeds black. On elevated, rough, uncultivated, bushy slopes in Morro de Monino, near Lopollo, at an elevation of about 5400 ft., sparingly ; fl. and young fr. Feb., ripe fr. May 1860. No. **815**. An annual climbing herb, with long shoots spreading diffusely in all directions ; leaves large, more or less reniform ; flowers yellow ; fruit cylindric-ellipsoidal, obtuse at both ends, yellowish-scarlet when ripe, non-operculate, 3-celled ; seeds black, enveloped in a hyaline mucilaginous aril. In exposed wooded places at an elevation of about 5500 ft., in Morro de Lopollo ; seeds, 24 May 1860. COLL. CARP. 45.

4. **ADENOPUS** Benth. ; Benth. & Hook. f. Gen. Pl. i. p. 823.

1. **A. breviflorus** Benth. in Hook. Niger Fl. p. 372 (1849) ; Hook. f. in Oliv. Fl. Trop. Afr. ii. p. 528 ; Cogn. in DC. Monogr. Phan. iii. p. 412 (1881).

LOANDA.—A more or less glandular-shaggy, apparently annual, herb, with the habit not unlike that of *Lagenaria vulgaris* Ser., running far in the sea-sands among grasses and *Ipomœa carnosa* Br. and *I. biloba* Forsk. ; flowers whitish ; between Penedo and Conceição, very rare ; fl. beginning of March 1855. A climbing, scentless herb ; leaves bright-green, rather glossy, scabrid, with two opposite conical glands at the insertion of the petiole ; flowers dicœcious, white, large ; calyx of the male flowers clavate-tubular, limb short, lobes subulate, uncinate-reflexed ; petals broadly obovate-spathulate, densely hirsute inside on the claw, lamina thickly nerved, crisp on the margin ; stamens triadelphous, inserted a little below the middle of the calyx-tube ; anthers cohering in a compact cylinder ⅔ in. long, muticous, very long, gyroseplicate, white ; on the drier hills, among short bushes above the city of Loanda, by the road towards Maianga ; male fl. 21 April 1858. Stem and petioles angular ; leaves rough, rather hard, rigid, deep-green above, pale-green beneath, delicately veiny between the nerves, perfectly 7-lobed or 5-lobed, the basal lobes being more or less confluent ; petiole with two opposite glands at the apex ; the glands ovoid-conical, fleshy, turgid, rather hard, subulate-acuminate, rather

shining; in exposed uncultivated hilly places at Alto das Cruzes; flowers dicœcious, the female ones solitary, on angular pedicels ½ to 1 in. long; calyx ovoid-elliptical, limb 5-partite; lobes fleshy, thick, subulate, bi-glandular at the base and with another thick fleshy large ovoid-conical acute gland at the middle or towards the apex, all these glands resembling laciniate leaflets; petals 5, a little smaller than in the male flower, inserted around the throat of the calyx-limb, obovate-spathulate, white, rather fleshy, entire, crisp and more or less inflexed on the margin, pervaded by thick green nerves, apiculate, the middle nerve produced and with several glands at the apex; ovary ellipsoidal-ovoid, inferior, 3-celled; placentas parietal, many-ovuled, thinly hoary-tomentose all over; style cylindrical, trifid; stigmas 3, thickened, deeply bilobed, obtuse, connivent, sordid-yellow; lobes erect, somewhat inflexed at the apex; rudiments of the stamens 3, acutely conical, opposite the petals, whitish, smooth, subulate; female fl. 14 July 1858. Berry at first ellipsoidal, densely beset with rigid hyaline hairs, as it ripens becoming more or less globose, glossy-green, variegated with elongated horizontal white spots, hard, 3 to 4 in. in diameter, with a white very bitter flesh. In rugged places at the palace; female fl., 28 Aug. 1858. A dicœcious apparently perennial herb, extensively climbing or procumbent to a great distance, rough; stem softly pubescent, obtusely angular-furrowed, flexuous, 5 to 16 ft. long; tendrils bifid, the two branches very unequal; leaves palmately lobed, rather rough on both faces, deep-green above, pale-green beneath; furnished at the insertion of the petiole with two opposite conical fleshy black-green shining subulate glands, which are $\frac{1}{12}$ in. long; petiole an inch long. Female flowers axillary, on a peduncle as long as or a little longer than the petiole; calyx-tube elongate-ovoid, velvety-hoary, almost tomentose, adnate to the ovary; limb superior, very deeply 5-cleft, lobes from a broad base abruptly subulate, trifid, all the segments biglandular at the base with glands of the same shape as those at the apex of the petiole; petals crisp on the entire inflexed margin, whitish; style short, white; stigma coroniform, with three deeply bifid very thick yellow obtuse erect-spreading or almost connivent lobes; rudiments of the stamens 3, subulate from a broad base, gland-like, scarcely longer than $\frac{1}{12}$ in.; ovary 6-celled. Berry perfectly spherical, umbilicate with the remains of the calyx-limb, when immature about 3 in. in diameter, bright-green, variegated with densely crowded white spots, filled with a white firm very bitter flesh, 6-celled, many-seeded, usually even when quite ripe keeping a whole year in an unaltered state without decaying; seeds ovate-lanceolate, truncate at the base, surrounded by an obtuse thickened border. In hilly bushy places near Loanda, rather rare; fl. and young fr. Aug. 1858. Negro name "Ditanga-Sese," Coloquintida bastarda. No. **852**. Ripe seeds of the Coloquintida bastarda (Pseudo-Colocynthis). COLL. CARP. 606.

GOLUNGO ALTO.—A dark-green dicœcious herb, very widely climbing; flowers white, very fragrant by night. Very abundant and nearly everywhere in thickets at the skirts of forests, especially about Sange, flowering in the rainy season, fruiting in winter; fl. and fr. Sept. 1855 and March 1856; also in half-shady rich soils between Sange and Undelle, female fl. March 1856. No. **853**. Climbing in masses; fruit 3½ to 4 in. in diameter. Sange; fr. 1855. "Pseudo-coloquinta." COLL. CARP. 607. Flowers large, white, rather fleshy; fruit globose, as large as a very big orange, greenish-white, variegated with spots. Everywhere climbing in dense thickets, near Sange, etc.; fl. from

March to June, fr. Oct. 1856. The "coloquinta" of the shops. Coll. Carp. 146.

Mossamedes.—In a sandy bushy place at the banks of the river Bero, Mata dos Carpenteiros; only one plant seen, in young fr. Aug. 1859. No. **811.**

Prince's Island.—In thickets at the skirts of forests near Bahia de Santo Antonio, abundant; sparingly in fl. and fr. Sept. 1853. No. **851.**

5. **EUREIANDRA** Hook. f. in Benth. & Hook. f. Gen. Pl. i. p. 825.

1. **E. formosa** Hook. f. in Benth. & Hook. f. Gen. Pl. i. p. 825, and in Oliv. Fl. Trop. Afr. ii. p. 533 (*Euryandra formosa*); Cogn., *l.c.*, p. 415.

Golungo Alto.—A rough dicœcious herb, climbing on trees to a considerable height, remarkable for its large golden-yellow flowers; male flowers very large, deep-yellow. Female flowers smaller than the male; stamens 5, sterile, bearded, free or combined at the extreme base; ovary cylindrical, many-ovuled; style proportionately long, trifid; stigmas thick, papillose, broadly obcordate; ripe fruit 3 in. long, 1 in. thick, cylindric-fusiform, at first dusky-green and covered with scattered warts, soon turning beautifully scarlet and beset with white persistent warts, many-seeded; seeds black, almost spherical, pea-shaped. By the taller dense apparently secondary thickets along the base of the mountains of Serra de Alto Queta, sporadic; fl. March and beginning of Dec. 1855; fr. June 1856. No. **807.** Leaves thinly coriaceous; seeds like pepper. Near Ponte de Luiz Simões, June 1856. Coll. Carp. 603.

Pungo Andongo.—A slender high-climbing herb, at length hanging down a long distance; stem and tendrils somewhat reddish; leaves herbaceous-membranous, very bright green; flowers large, yellow. At the skirts of the primitive forest between Pungo Andongo and Candumba; only one specimen, in male fl. April 1857. No. **819.**

6. **LAGENARIA** Seringe; Benth. & Hook. f. Gen. Pl. i. p. 823.

1. **L. vulgaris** Seringe in Mém. Soc. Phys. Genèv. iii. pars 1, p. 25, t. 2 (1825); Welw. Apont. p. 556, sub n. 129; Hook. f. in Oliv. Fl. Trop. Afr. ii. p. 529; Cogn. in DC. Monogr. Phan. iii. p. 417 (1881); Ficalho Pl. Uteis, p. 186 (1884).

Loanda and Barra do Bengo.—An annual herb, 8 ft. high, prostrate procumbent or scandent far and widely, viscid-shaggy, strongly musk-scented; stem flexuous, rather thick; lobes of the leaves long-cuspidate; petiole at the insertion of the leaf-blade furnished with two opposite conical green glands; tendrils almost always bifid, not 3 to 4-cleft; flowers axillary, fasciculate or solitary, monœcious, white or whitish; fruit pear-shaped, with a long neck, of great economic use to the negroes. In sandy bushy places at the margins of streams near Quicuxe and towards Cacuaco; fl. and young fr. beginning of Sept. 1858. Male flowers on somewhat longer peduncles than the female. Calyx of the female flowers campanulate, adnate to the ovary, lobes of the limb linear; corolla white, pervaded by thick green nerves; lobes of the corolla obovate, entire, crisp-involute on the margin, with long villous hairs especially inside at the base. Immature berry obovoid-pyriform, green, glabrous, smooth, 4½ in. long, 3 in. in transverse diameter, 10-furrowed, obtusely 10-ribbed, white-fleshy inside, 3 (or sub-6) celled; flesh not turning bitter; placentas parietal, 2 in each cell, from the beginning separated by a membrane

between them and thus making the fruit quasi 6-celled ; seeds ovate-lanceolate. On the sandy shore between Penedo and Conceição, rather rare ; fl. and young fr., one specimen, beginning of Aug. 1858. At the banks of the river Bengo ; fr. Dec. 1853. In moist thickets along streams and in immense quantity at the banks of the river Bengo and near Quicuxe ; also in maritime sandy sparingly grassy places between Penedo and Conceição ; quite wild and abundant ; fl. beginning of March 1858. No. **854**.

Golungo Alto.—A herb, climbing to a great distance ; flowers white. Very frequently cultivated and often wild, at the bushy grassy banks of streams near Sange ; fl. and fr. end of Feb. 1856 ; and near Bango, fr. July 1857. Native name "Binda," which is used also for different varieties. A variety with small fruit, *L. microcarpa* Naud. in Rev. Hort. 1855, p. 65 cum fig. It is difficult to decide whether this plant is indigenous here, but it is certain, according to Mariano, one of Welwitsch's informants on such matters, that the Binda was in frequent use among the negroes long before the conquest of the country by the Portuguese. The variety with oblong fruit, which is not bitter, is called in the trade by the negroes "Dinhungo," and is eaten like the "Abobora branca," the Portuguese name of this species in Portugal. No. **859** and Coll. Carp. 143.

Huilla.—An annual or biennial herb, occasionally dicœcious, sometimes monœcious, the whole plant musk-scented ; stem angular ; leaves nearly undivided or somewhat lobed, unequally crenate-denticulate : petiole rather long, with two opposite glands at the insertion of the leaf-blade ; tendrils bifid ; peduncles axillary, solitary, 1-flowered ; petals obovate, narrowed at the base, not acute at the apex but acuminate in the middle ; fruit flask-shaped, at the neck much shorter and thicker than in the forms cultivated in Europe, eaten by the negroes and recent colonists, when dry used for many domestic purposes and serving instead of the shells of ostrich eggs. Everywhere wild about dwellings, but the true home unknown (as is the case with the majority of the most useful plants). Near Lopollo, Ohai, Humpata, etc. : Lopollo, male fl. 2 April 1860. An edible variety. No. **860**.

7. **ACANTHOSICYOS** Welw. ex Benth. & Hook. f. Gen. Pl. i. p. 824.

1. **A. horrida** Welw. ex Benth. & Hook. f. Gen. Pl. i. p. 824, and in Trans. Linn. Soc. xxvii. p. 31, tt. xi. xi.A (1869) ; Hook. f. in Oliv. Fl. Trop. Afr. ii. p. 531 ; Cogn. in DC. Monogr. Phan. iii. p. 419 (1881) ; Ficalho, Pl. Uteis, p. 187 (1884).

Mossamedes.—A very singular shrub, 3 to 4 ft. high, repeatedly branched, with its decumbent-ascending very ramulose and highly intricate branches forming little mounds 10 to 15 ft. in diameter at the base, covered by degrees with blown sand 5 to 10 ft. high, gummy ; habit not very different from that of *Asparagus stipularis* Forsk. in Portugal ; stems green-glaucous, cylindrical, sulcate-striate, very tenacious, flexible, much branched ; branches and the somewhat shaggy branchlets furnished at the base on both sides with a spinescent stipule ; leaves apparently wanting or very deciduous ; flower-buds green outside, greenish-yellow inside ; calyx-lobes 5, unequal or sometimes equal, ovate, acute. In sandy deserts between Porto de Pinda and Banza de Caroca, S. Lat. 16°, abundant ; not yet in full flower, beginning of Sept. 1859. Called by the negroes "Nara," "M-nara," or "Naras." No. **806**.

Namaqua Land.—Collected by A. B. Wollaston. Coll. Carp. 602.

8. **RAPHANOCARPUS** Hook. f. in Hook. Ic. Pl. t. 1084 (1871).

1. **R. Welwitschii** Hook. f., *l.c.*, and in Oliv. Fl. Trop. Afr. ii. p. 541; Cogn. in DC. Monogr. Phan. iii. p. 427 (1881).

Mossamedes.—A prostrate, much-branched, monœcious, annual herb; leaves cordate; flowers of a bright and deep orange colour; peduncle of the male flowers adnate to the petiole; ovary slender, elongated, crowned with the calyx-segments. In an exposed sandy place at the banks of the river Bero; only one plant seen; fl. July 1859. No. **790**.

9. **MOMORDICA** Tourn., L.; Benth. & Hook. f. Gen. Pl. i. p. 825.

1. **M. cissoides** Planch. ex Benth. in Hook. Niger Fl. p. 370 (1849); Hook. f. in Oliv. Fl. Trop. Afr. ii. p. 535; Cogn. in DC. Monogr. Phan. iii. p. 430 (1881).

Golungo Alto.—An extensively climbing herb, apparently dicœcious, with the habit of a *Cissus*; leaves deep-green, glossy, rather rigid; in the male flowers calyx deeply 5-cleft, with green segments and dusky tube; petals 5, obovate-oblong, very obtuse, milk-white, marked inside at the base with a digitate black-purple spot; stamens 3 or rather triadelphous, one usually bearing only one anther, the other two bearing two anthers on the bifurcate connective; pollen bright-orange; fruit like a small hen's egg in size and shape, very densely echinate with long soft prickles, of an orange or orange-scarlet colour when ripe. By fences and thickets along the base of the mountains of Serra de Alto Queta; fl. and young fr. 9 Dec. 1855; near Ponte de Felix Simões, fr. Feb. 1855. No. **820**.

2. **M. Welwitschii** Hook. f., *l.c.*, p. 538; Cogn., *l.c.*, p. 435.

Mossamedes.—In sandy places among short bushes along the banks of the river Bero, by no means abundant; fl. and young fr. 14 June 1860. No. **787**.

3. **M. Charantia** L. Sp. Pl. edit. 1, p. 1009 (1753); Schmidt, Beitr. Fl. Cap. Verd. Ins. p. 272 (1852); Hook. f., *l.c.*, p. 537; Cogn., *l.c.*, p. 436; Ficalho, Pl. Uteis, p. 188 (1884).

Var. *β.* **abbreviata** Seringe in DC. Prodr. iii. p. 311 (1828); Cogn., *l.c.*, p. 437.

Loanda.—A herb, widely scandent or prostrate, polymorphous in fruit and foliage. In the drier bushy pastures, principally in sandy places, near Penedo and throughout the district, abundant; fl. and fr. March 1854 and April 1858. No. **785**. In sandy pastures at Penedo, in company with Sousa; seeds, Sept. 1860. Coll. Carp. 44.

Golungo Alto.—A green subglaucous herb, widely diffuse or climbing on low shrubs; fruit as large as a pigeon's egg, red-orange, pyramidately acuminate, angular, with warted or crested angles; by thickets in exposed places near Camilungo; fl. and young fr. Feb. 1856. No. **786**. Differing from the common forms by the leaves being hairy along the nerves; in rocky woody places in Sobato de Quilombo-Quiacatubia, at an altitude of 2400 ft.; fl. April 1855. No. **786***b*. A widely climbing herb; stem furrowed, angular; leaves grass-green, rough, subglaucous beneath; in primitive forests at the spring of Quibôlo, at the base of Serra de Alto Queta; without fl. or fr. 19 March 1856. Apparently this species. No. **836**.

Mossamedes.—An annual or biennial herb, very extensively climbing or sometimes prostrate; flowers pale-yellowish or yellow; fruit of

a brilliant orange colour, always softly echinate; very abundant at the sandy banks of the river Giraul and rarer by the river Bero; fl. and fr. July 1859. More abundant than *M. Welwitschii* Hook. f. No. **788**.

Cape de Verde Islands.—In sandy maritime places near Villa da Praya in the island of Santiago; fl. and fr. Jan. 1861. No. **789**.

4. **M. Balsamina** L. Sp. Pl., edit. 1, p. 1009 (1753); Hook. f., *l.c.*, in Oliv. p. 537; Cogn., *l.c.*, p. 439.

Benguella.—Cultivated from Portuguese seeds, June 1860. Portuguese name "Balsamina conica da pequena." Seeds. Coll. Carp. 604.

5. **M. multiflora** Hook. f., *l.c.*, p. 540; Cogn., *l.c.*, p. 449.

Golungo Alto.—A high-climbing deep-green herb, apparently monœcious. In moist forests at the river Moio (Muio) in Sobato de Quilombo-Quiacatubia, rare; in unopened fl. and young fr. July 1856. On Musondo (*Pseudospondias microcarpa* Engl.). No. **843**.

6. **M. Schimperiana** Naud. in Ann. Sc. Nat. ser. 5, p. 23 (1866); Cogn., *l.c.*, p. 453.

M. cucullata Hook. f. in Oliv. Fl. Trop. Afr. ii. p. 538.

Golungo Alto.—An annual, bright-green, monœcious herb, extensively and intricately climbing on shrubs, but to no great height; sometimes spreading over the ground; runners very long, intricate; petiole winged-channelled, broad, decurrent on the acutely angular stem; involucre of the male flowers boat-shaped; flowers white or on weak individuals almost of a citron-sulphur colour, coloured at the bottom with velvety-purple spots; calyx hispid, black; petals obovate-oblong, some a little narrower than the rest, at the time of flowering spreading in a campanulate form, from whitish to very pale sulphur-colour or almost milk-white, the three opposite to the triadelphous stamens marked inside at the base with a black varnished-glossy spot, all moreover yellow at the base inside; stamens 5, triadelphous; fruit oblong, as large as a hen's or goose's egg, deep-yellowish, clothed with long soft bristles of the same colour or brilliantly scarlet turning to orange-vermilion. By thickets in hilly situations among the mountains of Alto Queta, not uncommon, fl. and young fr. March 1856; along the base of the mountains of Queta, male fl. beginning of Dec. 1855. No. **809**. Flowers sulphur-yellow, atropurpureous at the bottom; berry as large as a goose's egg, 3-valved, densely beset with long soft cinnabar-orange prickles. Near Sange, Jan. 1856; seeds. Doubtfully identified. Coll. Carp. 151.

10. **LUFFA** Tourn., L., Adans.; Benth. & Hook. f. Gen. Pl. i. p. 823.

1. **L. ægyptiaca** Mill. Gard. Dict. edit. 8 (1768); Hook. f. in Oliv. Fl. Trop. Afr. ii. p. 530; Ficalho, Pl. Uteis, p. 187 (1884).

L. cylindrica Roem. Syn. fasc. 2, p. 63 (1846); Cogn. in DC. Monogr. Phan. iii. p. 456 (1881).

Cazengo.—A handsome herb, climbing high on shrubs; fruit cylindrical when young and quite green. In moist wooded situations with tall bushes near Palmira, very sparingly; fl. and young fr. Dec. 1854. No. **818**.

Golungo Alto.—Flowers said to be monœcious, but the individual plants seen by Welwitsch were usually wholly female. Stems acutely angular; peduncles of the male flowers sulcate-angular, 8 in.

long, flattened towards the apex; bracts beset outside with large circular glands; corolla 5-partite nearly to the base, beset on the inner face with long thin hairs which are more densely crowded at the base; corolla-segments of the male flowers obovate, obtuse, abruptly acuminate, 1¼ inch long, slightly crenate-wavy on the margin, pervaded with 3 thick nerves which form as many furrows on the inner face; female flower always smaller than the male ones, with petals scarcely ½ in. long. On the drier slopes near Sange, extensively running along the ground amidst grasses and low shrubs; fl. June and July; fr. Nov. 1855. No. **800**. Flowers monœcious; fruit half a span long, cylindrical, but little ventricose in the middle, dry, subangular, operculate at the top. In thickets near Sange; fr. July 1857. COLL. CARP. 148. A widely climbing herb; seeds; COLL. CARP. 601.

11. **CUCUMIS** L.; Benth. & Hook. f. Gen. Pl. i. p. 826.

1. **C. angolensis** Hook. f. ex Cogn. in DC. Monogr. Phan. iii. p. 487 (1881). *Cucumis* (sp.), Hook. f. in Oliv. Fl. Trop. Afr. ii. p. 547.

MOSSAMEDES.—A polymorphous plant. In sandy bushy places at the banks of the river Bero (Charneca da boca do Bero); fl. and young fr. July and August 1859. No. **831**.

2. **C. sagittatus** Peyritsch ex Wawra & Peyr. in Sitz. Ber. Wien, xxxviii. No. 25, p. 567 (1860); Hook. f., *l.c.*, p. 546; Cogn., *l.c.*, p. 488.

MOSSAMEDES.—Variable as to the shape and hairiness of the leaves. Fruit 2 in. long by 8 in. thick. In gravelly places with scanty herbage, along the banks of the river Bero; sparingly in fr. July 1859. No. **830**.

3. **C. Welwitschii** Cogn., *l.c.*, p. 490.

C. hirsutus Hook. f., *l.c.*, p. 546 (partly), non Sond.

AMBACA.—A dicœcious herb with tuberous perennial rootstock, decumbent or climbing stems, yellowish flowers, and strigose-hirsute ovary, but smooth fruit. In sandy wooded places, the trees chiefly consisting of *Echinodiscus* or some allied genus (cf. *Amerimnon nitidulum* O. Kuntze; Welw. Herb. No. 1885), between the river Lucala and Zamba, at an elevation of 3000 ft. sparingly; fl. and young or nearly ripe fr. Oct. 1856. No. **803**.

4. **C. longipes** Hook. f., *l.c.*, p. 547; Cogn., *l.c.*, p. 491.

LOANDA.—An annual procumbent herb; the stem and very long branches acutely angular; flowers monœcious, deep-yellow, the female ones on remarkably long peduncles; ripe fruit as large as a pigeon's egg, fleshy-juicy, with the scent and flavour of a cucumber, greenish-glaucescent outside, echinate with short, herbaceous, rather rigid, subobtuse prickles. In sandy maritime places at Praia de Zamba Grande, also at the back of the city of Loanda; fl. and fr. end of August 1858. No. **848**. Fruit as large as a good-sized walnut, echinate and of a deep sulphur colour outside. In sea sands about Loanda; fr. March 1854 and again in 1858. This must be compared with the next species. COLL. CARP. 605.

CAZENGO.—A rough, much branched, prostrate herb, with long runners; fruit-peduncle 3½ in. long; young fruit ellipsoidal, green, 2 in. long, 1⅓ in. thick, as large as a small hen's egg. In dry stony places at the banks of the river Luze, among sparse herbage; sporadic; young fr. Dec. 1854. No. **824**.

Golungo Alto.—A prostrate, flaccid herb, running a long distance; flowers monœcious, yellow; fruit oblong-ellipsoidal, when ripe pale yellow, 1½ to 1¾ in. long, smooth, without prickles. In secondary thickets at Quibixe in Sobato de Bumba, uncommon; fl. and young fr. beginning of June 1856. No. **846**.

The presence of prickles on the fruit in No. 848 throws doubt on the distinctness of this from the next species.

5. **C. chrysocomus** Schum. in Dansk. Vid. Selsk. iv. p. 201 (1829); Welw. Apont. p. 556 sub n. 129, and p. 589, n. 63 (*chrysocarpa*).

C. ficifolius A. Rich. Fl. Abyss. i. p. 294 (1847), t. 53 *bis*; Cogn., *l.c.*, p. 493. *C. Figarei* Delile in Cat. Hort. Monsp. ex Naud. in Ann. Sc. Nat., ser. 4, xi. p. 16 (1859); Hook. f., *l.c.*, p. 543.

Var. **echinophorus** (Naud.).

Loanda.—An annual herb, running out a long distance; flowers yellow; fruit as large as a pigeon's egg or usually larger, echinate with herbaceous prickles, sulphur-golden-yellow when ripe, handsome, tasting like cucumber. On the sandy sea shore near Penedo and Praia de Zamba Grande, abundant; fl. and fr. beginning of May 1858 (also more frequently in the years 1853 and 1854, but the specimens destroyed). No. **847**. Annual; stems spreading along the ground; leaves pinnatifid-lobed; fr. 1½ to 1⅔ in. long, obtusely ellipsoidal, of a deep sulphur-golden colour, echinate with long prickles; Cacuaco, fr. August 1858. Coll. Carp. 149.

The three following Nos. are perhaps varieties of this species, but the first must be compared with the next following species:—

Mossamedes.—In the sandy desert along the sea coast, between Cabo Negro and Mossamedes, at Cazimba, sparingly; female fl., 3 Sept. 1859. No. **821**. Flowers yellow. A young prostrate specimen in a moist sandy place, not far from the bank of the river Bero, sporadic, perhaps more abundant in summer; not yet in good fl., in winter, July 1859. No. **835**.

Golungo Alto.—An annual prostrate herb; leaves pedatifid-laciniate, rough; fruit as large as a small hen's egg, ellipsoidal, yellow; flowers not seen. In neglected plots of cultivation near Sange; seeds, summer of 1857. Coll. Carp. 129.

Ambriz.—Capital de Ambriz "Maxiché." Coll. Carp. 150.

Welwitsch in Apont. p. 556 under n. 129 states that *Cucumis africanus* L. f. is seldom cultivated in Angola, and is called "Machiché": with reference to this statement Ficalho, Pl. Uteis, p. 190, remarks that this South African species has no qualities to recommend it for cultivation, but that the name Machiché is given to the Brazilian *C. Anguria* L., and that this is more probably the species intended by Welwitsch. It is possible that *C. longipes* Hook f. was intended.

6. **C. prophetarum** L. Cent. i. Plant. p. 33. n. 97 (1755); Hook. f., *l.c.*, 545; Cogn., *l.c.*, p. 495.

Benguella.—A prostrate annual herb, stretching out a long way in the blown sand; fruit ellipsoidal 1½ in. long, smooth, sordid-yellow (spotted all over with yellow), marked with sordid-red (or white and green) bands. In maritime sandy places near the city of Benguella; only mutilated specimens found; male fl. and fr. latter part of June 1859. No. **829**. An annual herb running on the ground, almost entirely destroyed and only the fruits met with; fruit as large as a good-sized walnut or as a small hen's egg, ellipsoidal-globose, turning yellow,

marked with whitish rather broad longitudinal streaks and green and yellow spots, 3-celled; seeds, 19 June, 1859. Coll. Carp. 76.

Mossamedes.—An annual much-branched herb, very widely diffuse, prostrate; flowers yellow; fruit ellipsoidal, as large as a walnut, turning yellow, beset all over with herbaceous prickles and marked above with longitudinal brown-purple bands. In the gravelly beds of dried up streams in the desert between Cabo Negro and A Cazimba, in the region of the sea-coast; fr. 3 Sept. 1859. No. **828**.

7. **C. metuliferus** E. Mey. ex Schrad. in Linnæa xii. p. 406 (1838); Naud. in Ann. Sc. Nat., Ser. 4, xi. p. 10 (1859); Hook. f., *l.c.*, p. 543; Cogn., *l.c.*, p. 499.

Ambriz.—In sandy thickets at the river Quizembo, near Quizembo; male fl. Nov. 1853. No. **839**.

Golungo Alto.—Fruit from yellow-orange to cinnabar-red, echinate with black-green or glaucescent spines. In bushy wooded places at the banks of the river Quiapoze, near Sange; fl. and nearly ripe fr. June and Aug. 1856. No. **850**. A herb, climbing far and high, with yellow flowers. At the borders of forests in wooded hilly places in Sobato de Mussengue; fl. May 1856. No. **850***b*.

Pungo Andongo.—Scandent in secondary woods by the denser thickets between Candumba and Calundo-Caquette; young fr. Jan. 1857. No. **825**.

8. **C. dipsaceus** Ehrenb. in Spach, Hist. Nat. Vég. Phan. vi. p. 211 (1838); Hook. f., *l.c.*, p. 543; Cogn., *l.c.*, p. 500.

Loanda and Icolo e Bengo.—An annual prostrate herb, with the habit almost of *C. Melo* L.; flowers monœcious; corolla gamopetalous, campanulate, yellow; stamens 3; anthers sinuous-linear, adnate to the connective on the outer side below its apex; ovary in the male flowers rudimentary, in the female flowers cylindric-oblong, thinly tomentose. In waste places in the city of Loanda; fl. and fr. middle of July 1858, wild. In sandy places by the river Bengo, at Foto, etc., Sept. 1857. No. **849**.

Welwitsch states that the plant is frequently cultivated in gardens near the river Bengo: with reference to this statement Ficalho, Pl. Uteis, p. 189 (1884), considers that there may have been some confusion between this species and wild forms of *C. Melo* L.; this is the more probable, inasmuch as Welwitsch included under the same No. a specimen from Imbondeiro dos Lobos, in the same district, cultivated 26 March 1858, which he called *C. Melo* L.

9. **C. subsericeus** Hook. f., *l.c.*, p. 545; Cogn., *l.c.*, p. 506.

Pungo Andongo.—Seeds surrounded by a thickened border. In sandy bushy places at the banks of the river Cuanza, sporadic; fl. and fr. March 1857. Also a weaker specimen in rocky rough places near Sansamanda. No. **838**.

12. **COLOCYNTHIS** L. Syst. edit. 1 (1735); Tourn. ex Quer, Fl. Espan. iv. p. 389 t. 54 (1764). *Citrullus* Forsk. (1775); Benth. & Hook. f. Gen. Pl. i. p. 826.

1. **C. amarissima** Schrad. Ind. Sem. Hort. Gotting. p. 2 (1833). *Cucurbita Citrullus* L. Sp. Pl., edit. 1, p. 1010 (1753). *Citrullus vulgaris* Schrad. ex Eckl. & Zeyh. Enum. Pl. Afr. Austr. (pars ii.) p. 279 (1836); Hook. f. in Oliv. Fl. Trop. Afr. ii. p. 549; Cogn. in

DC. Monogr. Phan. iii. p. 508 (1881); Ficalho, Pl. Uteis, p. 190 (1884). *Colocynthis Citrullus* O. Kuntze, Rev. Gen. Pl. i. p. 256 (1891).

Loanda.—A prostrate annual herb, scarcely glaucous; branches very long; flowers monœcious, small, yellow; fruit ellipsoidal, greenish, variously spotted, half the size of an orange or as large as one, not quite good in flavour. In sandy places and sandy clay among short bushes, also in waste places, throughout the district, especially between Camama and Catumba, abundant and indeed wild; fl. and young fr. July 1858. Also a form with acutely-lobed leaves, in the sandy desert near Camama, at the beginning of Aug. 1858. No. **858**. Fruit woolly when young, nearly glabrous when ripe, eaten by the negroes. In sandy places, cultivated or neglected, and in gravelly fields, along the sea coast, not uncommon; Praia de Zamba grande, Maiango do Povo, fl. and young fr. Feb. 1858; cultivated, Imbondeiro dos Lobos, 26 March 1858. Native name "N-xîbua" or "Maxîbua." No. **858***b*.

Pungo Andongo.—An apparently annual herb; stems running out a long distance, tendrilled but scarcely scandent, indeed always prostrate; flowers yellow, apparently monœcious; ripe fruit very like that which the Portuguese call Melancia (water-melon). Nearly everywhere in sandy places along the banks of the rivers Cuanza and Cuije; near Quitage, fl. March 1857. A weak, hoary, narrow-leaved form or variety. No. **857**. Fruit oblong-cylindrical, 1½ to 2 in. long, eaten by the negroes. In fields between Condo and Quisonde, cultivated, March 1857. But little different from the European water-melon. Coll. Carp. 153.

Mossamedes.—An annual prostrate herb, resembling the water-melon in all parts; fruit in shape and size resembling a quince, but sometimes much smaller and only 1½ to 1½ in. in diameter, usually scarcely larger than an orange, grass-green, variegated with white spots arranged in broad longitudinal rows, 3-celled; flesh bitter and therefore scarcely touched by sheep; seeds obovate, compressed but rather tumid, chestnut-coloured or brown-yellow, marked on both sides with black warts occasionally merging in lines. In sandy places along the banks of the river Bero, abundant; both young and ripe fr. and few fl. beginning of July 1859; also in moist sandy places near the mouth of the river Giraul, at Fazenda do Senhor Paiva, frequently cultivated. Also a wild luxuriant form, and a form in drier hilly gravelly places. Called by the colonists "Melancia brava" (wild water-melon). No. **855**. At the banks of the river Bero; fr. July 1859. Coll. Carp. 49.

Huilla.—An annual herb, spreading diffusely far and widely or extensively scandent; pilose with white spreading hairs, scented almost like musk; leaves lobed-pinnatisect; tendrils bifid; flowers hermaphrodite and male on the same plant, axillary, shortly pedunculate, yellow, the hermaphrodite ones the larger; fruit eaten by the negroes but nearly always more or less bitter. In sandy, rather barren fields and in more fertile places formerly cultivated, abundant almost throughout the district; near Lopollo fl. and young fr. March and 5 May, 1860; also by the river in Sobato Humpata, at the end of May 1860, specimens with the stem and petioles rather shaggy with rufous hairs. No. **856**. Fruit as large as a child's head, edible but almost insipid. In places of cultivation and neglected gardens, but scarcely cultivated; seeds, April 1860. Native name, "Ditangue" or "Mutangue." Coll. Carp. 47. Fruit eaten by sheep; in gardens. Called "Ditanga." Coll. Carp. 46.

The various varieties of this species, both wild and cultivated, especially about Loanda, are called "Quixíbua," in plural "Maxíbua," a name which in Pungo Andongo is used for *Ampelocissus urenæfolia* Planch.

The following numbers from the carpological collection appear to belong to *Colocynthis amarisissima* Schrad:—

Icolo e Bengo.—Seeds of "Abobora branca," March 1858. Coll. Carp. 164.

Huilla.—Seeds surrounded by a black border. Near Lopollo, Feb. 1860. Coll. Carp., 50. A wild sort of "melancia" in the arimo (cultivated field) of Kneisman; seeds, March 1860. Coll. Carp. 79.

2. **C. vulgaris** Schrad. Ind. Sem. Hort. Gotting. p. 2 (1833)

Cucumis Colocynthis L. Sp. Pl., edit. 1, p. 1011 (1753).

Citrullus Colocynthis Schrad. in Linnæa xii. p. 414 (1838); Hook. f. in Oliv. Fl. Trop. Afr. ii. p. 548; Cogn. in DC. Monogr. Phan. iii. p. 510 (1881); Ficalho, Pl. Uteis, p. 190 (1884).

Fruiting specimens of the true Colocynth obtained for comparison with the Angolan species of *Citrullus*. Coll. Carp. 608.

The seeds are not used medicinally in Angola.

13. **CUCUMEROPSIS** Naud. in Ann. Sc. Nat., ser. 5, v. p. 30 (1866). *Zehneria* Benth. & Hook. f. Gen. Pl. i. p. 830 (partly).

1. **C. edulis** Cogn. in DC. Monogr. Phan. iii. p. 518 (1881).

Cladosicyos edulis Hook. f. in Oliv. Fl. Trop. Afr. ii. p. 534; Ficalho, Pl. Uteis, p. 188 (1884).

Golungo Alto.—Ripe fruit subclavate-cylindrical, a foot long, 3 in. in diameter, eaten by the negroes. At the bushy margins of primitive forests in Sobato de Mussengue; fl. May, fr. July 1856. Also near Camilungo; male fl. Dec. 1855. No. **808**.

Coll. Carp. 617 consists of seeds, whitish glossy, flattened, ellipsoidal, $\frac{3}{4}$ in. long, $\frac{5}{8}$ in. broad, smooth, not bordered, said to belong to an edible fruit 5 to 7 in. long and 3 to $3\frac{1}{2}$ in. in transverse diameter: they possibly belong to this species, which, however, seems usually to have a longer fruit and smaller seeds. The seeds were collected in Golungo Alto, at Sange, in July 1856.

14. **PHYSEDRA** Hook. f. in Benth. & Hook. f. Gen. Pl. 1. p. 827.

1. **P. heterophylla** Hook. f. in Oliv. Fl. Trop. Afr. ii. p. 553; Cogn. in DC. Monogr. Phan. iii. p. 524 (1881).

Golungo Alto.—A succulent herb or undershrub, very widely climbing, the whole plant tinged with a glaucous hue, perennial, dicœcious, with the habit almost of a *Passiflora*; leaves remarkably polymorphous, undivided and triangular or 3- to 5-lobed, bright-green, thick, tender, rather fleshy, rigid, not coriaceous, easy to dry; corolla sordid-orange in colour, rather fleshy, 5-lobed, clothed inside with long papillæ; anthers 3, very thick, obovoid-cordate; filaments short; fruit oblong-subpyriform, 1 to $1\frac{1}{2}$ in. long, at first variegated with yellow and green, when ripe orange-coloured, with longitudinal green bands, quickly putrescent. In rugged places at the river Delamboa, in company with *Coffea melanocarpa* Welw.; without fl. Sept. 1855, in flower bud Jan. 1856; also along the banks of the stream Casaballa, among tall bushes, at the base of the mountains in

Sobato de Bumba, not uncommon; male and female fl. middle of Oct. 1855; fr. Feb. 1856 and June 1857. No. **791**.

Var. **Hookeri**. Var. β Hook. f., *l.c.*

Leaves subdigitately 7-lobed below the middle, acutely serrate with long points to the serratures, and the lobes terminating in longer slender tails.

Golungo Alto.—A much-branched almost frutescent herb, climbing far and widely, apparently rarely in flower. Along fences against primitive forests near Ponte de Felix Simões, sporadic; fl. Dec. 1855. No. **792**.

The following numbers from the carpological collection appear to belong to this species; they consist of seeds which show the character of a deciduous filamentous coat, giving many of the seeds a shaggy appearance, while other seeds are quite smooth :—

Golungo Alto.—An apparently perennial herb, climbing far and widely; leaves glaucescent, rigid; flowers yellow, fleshy; fruit ellipsoidal, orange-coloured, marked with green longitudinal bands. By fences and thickets near Ponte de Felix Simões; seeds Feb. 1856 (and June 1857). Coll. Carp. 144 and 147. Climbing on *Punica granatum* L., Welw. Herb. No. 2333, in the convent near Bango; seeds beginning of May 1856. Coll. Carp. 152. Fruit baccate, 1 to 1½ in. long, oblong-subpyriform, variegated yellow and green and marked with green bands, quickly becoming putrid; seeds Coll. Carp. 619.

15. **RAPHIDIOCYSTIS** Hook. f. in Benth. & Hook. f. Gen. Pl. i. p. 828.

1. **R. Welwitschii** Hook. f., *l.c.*, and in Oliv. Fl. Trop. Afr. ii. p. 554; Cogn. in DC. Monogr. Phan. iii. p. 527.

Golungo Alto.—A herb, climbing far and widely, apparently perennial, monœcious; leaves rather rigid, prettily green, very variable in indumentum but fairly constant in shape; male flowers seen on only a very few specimens; ripe fruit spherical, echinate with dense brilliantly purple-red bristles, deeply purple-red even in the densest forests, a remarkable ornament to the primitive forests, filled with a nearly dry pulp. In the denser primitive forests of Sobato de Mussengue, not uncommon but rarely seen in flower; in female fl. and nearly ripe fr. March 1855; in female fl. and very few male fl. in the same locality, end of March 1855. Also in the thickets of Serra de Alto Queta, but never seen in fl., June 1856. No. **810**.

16. **COCCINIA** Wight & Arn. Prodr. (i) p. 347 (1834). *Cephalandra* Schrad. (1836); Benth. & Hook. f. Gen. Pl. i. p. 827.

1. **C. decipiens** Cogn. in DC. Monogr. Phan. iii. p. 539 (1881).
Cephalandra decipiens Hook. f. in Oliv. Fl. Trop. Afr. ii. p. 552.

Pungo Andongo.—A bright-green, rather flaccid, climbing herb; flowers yellow; fruit baccate, as large as a hazel-nut, ovoid-conical, mucronate with a short acumen, green, at length orange-coloured, variegated with white spots, 3-celled; cells few-seeded. In sandy grassy places at the skirts of thickets between Catete and the forest of Quilanga, extensively climbing among grasses; in female and few male fl. and with young fr. beginning of May 1857. No. **816**. Fruit ovoid-conical, spotted with white; seeds scarcely ripe; May 1857. Coll. Carp. 618.

2. **Coccinia** ? sp. n ?

A scandent herb; branchlets hispid with spreading hairs; tendrils bifid, subglabrescent, elongated; fruiting peduncle thick, glabrate, 3½ to 4 in. long; fruit baccate, cylindrical-ellipsoidal, obtusely pointed at the apex, very nearly 3 in. long, orange-coloured, rather shining, quite smooth; seeds numerous, compressed, obovate, nearly ¼ in. long, ⅛ in. broad, margined, obscurely scrobiculate, exalbuminous.

Golungo Alto.—In thickets near Cambondo, abundantly, but only one fruit seen; without either leaves or fl. June 1855. No. **837** and Coll. Carp. 615.

17. **CUCURBITA** L.; Benth. & Hook. f. Gen. Pl. i. p. 828.

1. **C. maxima** Duchesne in Lam. Encycl. Méth. ii. p. 151 (1786); Hook. f. in Oliv. Fl. Trop. Afr. ii. p. 555; Cogn. in DC. Monogr. Phan. iii. p. 544 (1881); Ficalho, Pl. Uteis, p. 191 (1884).

Golungo Alto.—Fruit 1½ to 2½ ft. long, 1 to 1½ ft. in transverse diameter, variegated with pale-yellow as in the European examples. Frequently cultivated almost throughout the district both by the negroes and by the colonists for the sake of its edible fruit; fl. and young fr. end of Feb. 1856. Native name "Dinhângoa." No. **801**. Fruit subspherical, variegated yellow and green, outside marked with numerous obtuse ribs almost like a melon, wine-red inside, eaten by the negroes and Portuguese colonists; flesh somewhat dry but edible and not unpleasant. Frequently cultivated in the district; seeds, March 1856. Native name "Dinhângoa." Coll. Carp. 145.

2. **C. Pepo** L. Sp. Pl., edit. 1, p. 1010 (1753); Hook. f. in Oliv. Fl. Trop. Afr. ii. p. 556; Cogn., *l.c.*, p. 545; Ficalho, *l.c.*, p. 192.

Loanda.—Frequently cultivated; seeds, Aug. 1858. Coll. Carp. 609.

Huilla.—Monœcious, prostrate, running out a long distance; leaves broad, deeply quinquepartite in a palmate manner, the outer lobes bifid, the intermediate ones narrowed towards the base; fruit as large as a little child's head, bi-pyramidately ellipsoidal, deeply furrowed at the base, coarsely ribbed in the middle; skin hard, woody, of a pale sulphur colour outside, occasionally beset with small but little-prominent warts, filled inside with a white rather juicy flesh, very good to eat, with scarcely a gourd flavour. Cultivated by some colonists at Lopollo from seeds introduced fresh from Portugal; fl. and fr. April 1860. No. **812**. Delicious when boiled and better in flavour when in addition roasted; even the leaves are prepared like spinach and eaten; seeds, June 1860. Coll. Carp. 174. Generally and largely cultivated in the district; well flavoured when cooked and preserved. Portuguese name, "Abobora." Feb. and May 1860. Coll. Carp. 48.

Coll. Carp. 614 consists of seeds, perhaps of a hybrid form of this species, sent to Welwitsch under the name of "Aboboras pequenas bonitas" from gardens at Oporto in North Portugal, where it is cultivated as an ornamental plant.

3. **C. moschata** Duchesne ex Poir. in Dict. Sc. Nat. xi. p. 234 (1818); Hook. f., *l.c.*, p. 556; Cogn., *l.c.*, p. 546.

Loanda.—A large, procumbent, monœcious, annual herb, with the habit of *C. Pepo* L.; flowers large, yellow, axillary, solitary; the male flowers with longer peduncles than the female ones; calyx after flowering circumsciss at the neck; anthers 1-celled; stigmas bipartite,

thick; fruit ellipsoidal, when young as large as a pigeon's egg, somewhat furrowed or rather lined longitudinally, with white flesh, flavoured like a cucumber. In sandy maritime stations near Boa Vista, quite wild but probably introduced and an escape from cultivation; fl. and young fr. beginning of Aug. 1858. No **841**.

4. **C. ficifolia** Bouché in Verh. Ver. Gartenb. Berl. xii. p. 205 (1837); Cogn., *l.c.*, p. 547.

C. melanosperma A. Braun, Cat. Hort. Karlsr., 1824 (name only); Hook. f., *l.c.*, p. 556 in note; Ficalho, *l.c.*, p. 192.

Mossamedes (and Dande).—Ripe fruit perfectly ellipsoidal, rather flattened at both ends, not ribbed, of a bright grass-green colour, speckled with white spots at equal distances; flesh bright-yellow, turning red and very firm; seeds always black. The fruit is frequently preserved in sugar and in this state very highly appreciated for dessert. Occasionally cultivated in gardens about Mossamedes, where it had been recently introduced; ripe fr. at Cavalheiros, June 1860 (also by the river Dande). Called by the Portuguese colonists "Abobora Xila" or "Abobora Chila." No. **834** and Coll. Carp. 142.

18. **MELOTHRIA** L.; Benth. & Hook. f. Gen. Pl. i. p. 830. *Zehneria* Endl.; Benth. & Hook. f., *l.c.*, p. 830. *Mukia* Arn.; Benth. & Hook., *l.c.*, p. 829.

1. **M. tridactyla** Hook. f. in Oliv. Fl. Trop. Afr. ii. p. 562; Cogn. in DC. Monogr. Phan. iii. p. 596 (1881).

Golungo Alto.—A glaucous-green, monœcious, twining herb, climbing widely but not high; flowers yellow, the female ones solitary, the male ones sometimes solitary, at other times arranged in weak racemes; peduncles delicately capillary. In herbaceous shady parts of the primitive forests of Quibanga in Sobato de Mussengue on the left-hand side of the road from Sange to Ambaca; fl. and fr. middle of Dec. 1855. No. **826**.

2. **M. triangularis** Benth. in Hook. Niger Fl. p. 367 (1849); Hook. f., *l.c.*, p. 562.

Bryonia capillacea Schum. & Thonn. in Danske Vidensk. Selsk. iv. p. 204 (1829); *M. capillacea* Cogn., *l.c.*, p. 600.

Golungo Alto.—A glaucous-green, twining herb, with very small, yellow flowers. At the borders of thickets on the north side of Serra de Alto Queta, very sporadic; fl. and fr. middle of Dec. 1855, and in Jan. 1856. No. **827**.

3. **M. lucida** Cogn., *l.c.*, p. 606.

Pilogyne lucida Naud. in Ann. Sc. Nat., Ser. 5, v. p. 36, t. 6 (1866). *Zehneria lucida* Hook. f., *l.c.*, p. 559, in note.

Golungo Alto.—In the shade of the forests of Mata de Quibôlo; without either fl. or fr. August 1856. No. **862**.

4. **M. angolensis** Cogn., *l.c.*, p. 606.

Zehneria angolensis Hook. f., *l.c.*, p. 559.

Golungo Alto.—On bushy declivities along streams in the mountainous parts of Serra de Alto Queta, rather rare; scarcely in good fl., Nov. 1855. No. **842**. A herb, climbing horizontally; flowers small, white; fruit scarlet. In thickets at the borders of primitive forests in Serra de Alto Queta, at Zengas do Queta; in fr. and sparingly in male and female fl. Dec. 1855. No. **844**. A widely climbing herb;

stem fleshy-thickened at the base; leaves white-punctate or white-papillose on both faces. In the forests of Quibôlo; without either fl. or fr. April 1856. No. **844***b*.

5. **M. racemosa** Cogn., *l.c.*, p. 617.
Zehneria racemosa Hook. f., *l.c.*, p. 561.

Huilla.—A very rough and mostly prostrate, dicœcious herb; lobes of the leaves varying greatly in breadth, in some forms much narrowed. In the drier stony hilly thickets among low shrubs near Nene and the village of Lopollo; fl. Nov. and Dec. 1859; in neglected plots formerly cultivated near Mumpulla, Oct. 1859; in less dense thickets between Eme and the lake of Ivantalla, fr. Feb. 1860. No. **814** and Coll. Carp. 611. In rocky places among short bushes in Sobato de Humpata, between Humpata and Serra de Oiahuia, fl. and fr. Feb. 1860. No. **817**.

6. **M. maderaspatana** Cogn., *l.c.*, p. 623.
Cucumis maderaspatanus L. Sp. Pl., edit. 1, p. 1012 (1753). *Bryonia scabrella* L. f. Suppl. Pl. p. 424 (1781). *Mukia scabrella* Arn. in Hook. Journ. Bot. iii. p. 276 (1841); Hook. f., *l.c.*, p. 561.

Libongo.—A prostrate or scandent herb; flower yellow; fruit scarlet when ripe. In bushy fields formerly cultivated, near Libongo, at Arimo do Senhor Freire; fr. and only one fl. seen, Sept. 1858. No. **840**.

Golungo Alto.—An ashy-green herb, rough in all parts with harmless prickles; stems climbing widely and far; flowers monœcious, yellowish; fruit at first pale-green, pea-shaped, striate with dull-green bands, when ripe brilliantly scarlet, soft, juicy. By the shorter thickets on rather dry slopes about Canaûlo and Camilungo; fl. and fr. Feb. 1856. Also on dry declivities at the base of Serra de Alto Queta; fr. 8 Oct. 1855. No. **845**.

19. **DACTYLIANDRA** Hook. f. in Oliv. Fl. Trop. Afr. ii. p. 557. *Bryonia*, subgenus *Dactyliandra* Benth. & Hook. f. Gen. Pl. i. p. 829.

1. **D. Welwitschii** Hook. f., *l.c.*; Cogn. in DC. Monogr. Phan. iii. p. 626.

Loanda.—A tender, deep-grass-green, annual herb, 2 to 3½ ft. high or more, climbing far and high; flowers monœcious, whitish, white-yellowish, or nearly white; unripe fruit spherical, as large as a good sized pea, green; ripe fruit baccate, cherry-shaped, cinnabar-red. In thickets on a sandy-clay soil near Penedo, sparingly; fl. and young fr. beginning of Dec. 1857. In the denser thickets and by the old tamarind trees between Praia de Zamba grande an Cabo Lombe; fl. and ripe fr. May 1858. Also in rather dry thickets tween Imbondeiro dos Lobos and Bemposta; fr. June. No. **833**. Perennial, scandent; berries scarlet, exactly spherical; in maritime thickets, August 1858. Coll. Carp. 157. Near Penedo; fr. Dec. 1857. Coll. Carp. 610.

Mossamedes.—A climbing herb; stem angular, subscabrid, furrowed, deep-green as well as the scabrid leaves; flowers monœcious, rather small, green outside, from white to yellowish inside. By fences and thickets and in plots formerly cultivated, near Cavalheiros; fl. and young fr. 14 June 1860. No. **832**.

20. **KEDROSTIS** Medic. Phil. Bot. ii. p. 69 (1791). *Rhynchocarpa* Schrad. (1838); Benth. & Hook. f. Gen. Pl. i. p. 831.

1. **K. fœtidissima** Cogn. in DC. Monogr. Phan. iii. p. 634 (1881). *Rhynchocarpa fœtida* Schrad. in Linnæa xii. p. 403 (1838); Hook. f. in Oliv. Fl. Trop. Afr. ii. p. 564.

Var. *a.* **Perrottetiana** Cogn., *l.c.*, p. 635. *Bryonia Perrotetiana* Ser. in DC. Prodr. iii. p. 304 (1828).

Loanda.—A climbing herb, the whole plant very rankly fetid, the fetid odour persisting even in dried specimens after many years; stem angular, hairy; leaves cordate-ovate, repand, rather scabrid; flowers monœcious, yellowish, the male ones seated on reduced and very slender peduncles, the female ones solitary or on bipartite peduncles; fruit ellipsoidal, as large as a pea, conical-acuminate at the apex, crowned with the remains of the flower, 6- to 7-ribbed, scarlet when ripe, 2-celled, usually 4-seeded; seeds obovate, all thickened on the margin, attenuate and bilobed at the base. In sandy bushy places between Maianga do Povo and Bemposta; fl. and nearly ripe fr. end of April 1858 (and more abundant in 1854). No. **822**.

21. **CORALLOCARPUS** Welw. ex Benth. & Hook. f. Gen. i. 831.

1. **C. Welwitschii** Hook. f. ex Welw. in Trans. Linn. Soc. xxvii. p. 32, t. 12 (1869), and in Oliv. Fl. Trop. Afr. ii. p. 566; Cogn. in DC. Monogr. Phan. iii. p. 651 (1881).

Rhynchocarpa Welwitschii Naud. in Ann. Sc. Nat., Ser. 4, xviii. p. 198, t. 10 (1862).

Loanda.—A suffruticose, widely climbing, glaucous, succulent herb, the whole plant exuding a yellowish resinous juice, very tenacious of life (the nearly dry branchlets in the herbarium shooting afresh and throwing out both male and female flowers); rootstock woody, perennial; stem fleshy and almost turnip-shaped at the base, the parts above the ground slender, angular; tendrils long, simple, closely twisted in the form of spirals; flowers monœcious, axillary, yellowish-green, the male ones racemose-cymose, the female ones solitary; flowering branches, peduncles, and pedicels rather fleshy. In the male flower calyx tubular-campanulate, 5-cleft; corolla adnately inserted on the calyx, 5-parted, with spreading segments; stamens included, inserted at the base of the corolla-segments, (5 each bearing one anther or) 3, 2 of which bear 2 anthers each and are opposite to the corolla-segments, and the other one bears 1 anther alternating with the corolla-segments; (in one instance there were 3 stamens, each bearing 1 anther, and 1 stamen bearing 2 anthers;) filaments flattened, rather fleshy, straight, very short; connective straight, produced beyond the anthers, free or in the 2-anthered stamens connate; anthers linear, 1-celled, straight, vertical, adnate to the connective on one side; pistil obsolete. In the female flowers calyx-tube ovoid-oblong or urceolate, adnate to the ovary; limb subcampanulate, 5-cleft; corolla-segments 5, adnately inserted at the sinuses between the calyx-lobes, obovate, delicately fringed and glandular-ciliate on the margin, $\frac{1}{3}$ longer than the calyx-lobes, at the time of flowering erect-spreading, yellowish; staminodes 5, rudimentary, alternating with the corolla-segments; ovary inferior 2- or 3-celled; ovules several; style terminal, nearly included, cylindrical, rather thick, somewhat 2- or 3-divided a little below the stigma; stigma large, rotate-expanded, laciniate-fimbriate. Fruit ellipsoidal-cylindrical, $\frac{1}{2}$ in. long, rather obtuse, bright scarlet, 2-celled, separating when ripe in a circumsciss-operculate manner from the greatly thickened peduncle: seeds several, horizontal, wrapped in a coloured membrane.

In sandy bushy places, climbing on leafless Euphorbias, and on species of *Celastrus* and *Cordia*, between Penedo and Cacuaco, and also in Praia da Zamba Grande flowering and fruiting nearly throughout the year, not uncommon. Fl. Jan. to March 1854; fr. April to June 1858. A winter form in fruit almost leafless; abundant near Penedo, June 1858. A variety with the lobes of the leaves elongated and very much narrowed, near the city of Loanda, Oct. 1858. A specimen raised from Loanda seeds in the garden of the Duke of Palmella at Lisbon; fl. March 1862. No. **799**. Climbing far and widely. Rootstock napiform; stem and leaves glaucous; fruit baccate, shaped like a grape, operculate, deep scarlet. At Penedo; seeds Feb. 1854, and again Sept. 1858. COLL. CARP. 125 and 612. A perennial herb; stem bulbous-inflated at the base; the far-climbing stem and the leaves glaucous; flowers small, yellowish, rather fleshy, monœcious; fruit grape-like, circumsciss at the base, opening, many-seeded, bright scarlet. Cultivated in the Lumiar Garden at Lisbon from Loanda seeds; fr. July 1860. COLL. CARP. 84.

22. **CYCLANTHERA** Schrad.; Benth. & Hook. f. Gen. Pl. i. 836.

1. **C. pedata** Schrad. Index Sem. Hort. Gotting. anno 1831, and in Linnæa viii., Litt.-Ber., p. 23 (1833); Cogn. in DC. Monogr. Phan. iii. p. 825.

Var. *β.* **edulis** Cogn., *l.c.*, p. 826.

LOANDA.—Cultivated in the city of Loanda from seeds sent from Portugal; fr. 1853-4. COLL. CARP. 613.

23. **SICYOS** L.; Benth. & Hook. f. Gen. Pl. i. p. 837.

1. **S. australis** Endl. Prodr. Fl. Norf. p. 67 (1833); Cogn. in DC. Monogr. Phan. iii. p. 875 (1881).

S. angulatus Hook. f. in Oliv. Fl. Trop. Afr. ii. p. 568, non L.

HUILLA.—A widely climbing herb; flowers properly monœcious; calyx of the male flowers campanulate, herbaceous, 5-toothed; corolla campanulate, adnate to the calyx, yellowish; stamens connate; anthers 1-celled, confluent into a head. Female flowers clustered in abbreviated cymes; ovary 1-celled, 1-ovuled. By secondary thickets in hilly, grassy places between Nene and Lopollo, and about the great lake of Ivantalla; fl. and fr. March 1860. No. **813**.

24. **GERRARDANTHUS** Harv. ex Benth. & Hook. f. Gen. Pl. i. p. 840. *Atheranthera* Mast. in Oliv. Fl. Trop. Afr. ii. p. 519.

1. **G. Trimenii** Cogn. in DC. Monogr. Phan. iii. p. 937.

Atheranthera paniculata Mast., *l.c.* *A. Welwitschii* Mast. in Trans. Linn. Soc. xxvii. p. 640, fig. 1-5 (Nov. ? 1871).

PUNGO ANDONGO.—A widely scandent herb; stems woody at the base, compressed, almost flattened, marked with numerous deep furrows; leaves rather fleshy but membranous, deep-green above, pale-greenish beneath with deeper-green ribs; flowers diœcious, only the male ones seen, pendulous, green-yellowish, shining with a waxy gloss; calyx 5-cleft, green, lobes subequal, much shorter than the corolla; segments of the corolla 5, alternating with the calyx-lobes, the three outer ones alike, green-yellowish, the two inner ones broader and a little longer than the rest, concave, orange-yellow; all obtuse, rather fleshy, spreading at the time of flowering; stamens 5, one imperfect, four perfect; filaments thick, dilated at the apex into

the semicircular connective and furnished with an empty subulate appendage; anthers 1-celled, dehiscing longitudinally; connective externally marginal; ovary rudimentary, scarcely conspicuous, represented only by a central style. In thickets at the skirts of the forest of Mata de Pungo, sporadic; male fl. April 1857. No. **861**.

LXIV. BEGONIACEÆ.

A species of the section Mezierea of *Begonia* grows at the banks of streams in the dense forests of the mountainous region of Angola, and a second species of the genus belonging to the section Rostrobegonia is met with in moist and shady hollows within the fortress lines of Pungo Andongo. Welwitsch's discovery of these plants placed beyond doubt the existence of the family in tropical Africa. See Welwitsch in Journ. Linn. Soc. iii. pp. 151, 154 (1859), and Apont. p. 556, n. 130.

1. **BEGONIA** Tourn., L.; Benth. & Hook. f. Gen. Pl. i. p. 841.

1. **B. oxyloba** Welw. ex Hook. f. in Oliv. Fl. Trop. Afr. ii. p. 573; Warb. in Engl. Bot. Jahrb. xxii. p. 38 (1895).

Golungo Alto.—Stems cylindrical, rosy, brittle, 1 to 2 ft. high, ascending from the thick half-subterranean rootstock, which is filled with a watery juice; flowers from rosy to reddish; perianth-segments whitish-rosy, reniform-orbicular, pervaded with longitudinal purplish nerves running from the base towards the margin; anthers yellow; ovary conical-ellipsoidal, obtusely trigonous, marked on the sides and angles with a purplish line; styles 3, short, cylindrical, soon divided into yellow, very viscid, hippocrepiform-bifurcate stigmas. In primitive forests along streams in Mata de Quisucûlo in Sobato de Bango, in very shady places, sparingly; fl. beginning of Jan.; very scarce fr. March 1856; without fl. 8 Sept. 1855 and May 1856; fl. and fr. end of May 1856. No. **875**.

2. **B. rostrata** Welw. ex Hook. f., *l.c.*, p. 578.

Diplodinium (sp.), Welw. in Journ. Linn. Soc. iii. p. 154 (1859), and Apont. p. 556 sub n. 130 (*Diplodinium*).

Pungo Andongo.—An annual tender herb, 1 to 1½ ft. high; stem erect, cylindrical, succulent, smooth, blood-red or sometimes purple, nodose-jointed; leaves highly glossy, bright-green, and scattered with long thin white hairs above, paler beneath; petiole terete, blood-red, girt at the insertion of the leaf-blade with long approximated cilia; flowers small, pale-rosy; perianth-segments more or less ovate, those of the male flowers nearly always larger than those of the female, usually 5 (4 regular and the fifth much smaller than the four) in the female flower; filaments not very short, free, abruptly terminating in the clavate connective, to the opposite sides of which the cells of the anther longitudinally adhere but do not reach either its top or bottom; pollen whitish; stigmas velvety, horseshoe-shaped or lyrate; capsule unequally 3-winged, two wings equal, the third acutely narrowed into a long flattened beak. In the clefts and caverns of the most elevated rocks along streams, chiefly in shady damp situations, abundant, but restricted to particular spots; at Tunda-Quilombo within the fortress; fl. Feb. 1857; fl. and young fr. March and April 1857; fr. Oct. and

Nov. 1856. No. **874**. An annual erect herb, 2 ft. high; branches erect-spreading; fruits nodding, one wing produced to a considerable length like a beak. In rocky, half-shady places at the sides of a stream in Barrancos da Pedra Songue within the fortress; ripe fr. (also a young plant) Nov. 1856. No. **874***b*.

LXV. CACTACEÆ.

Previously to Welwitsch's Angolan journey, the occurrence of any member of this family in the Old World had been denied; "America is the exclusive station of the order, no species appearing to be native of any other part of the world" (Lindl. Veg. Kingd., edit. 3, p. 747 (1853)). It was therefore with much surprise and satisfaction that Welwitsch, in the primæval forests of Sobato Quilombo-Quiacatubia in Golungo Alto, met with specimens of a *Hariota*, which were suspended in long spikes, covered with thin white berries, on the mossy branches of species of *Edwardia* and *Adansonia*; a variety was also found hanging down from the most elevated rocks of the fortress of Pungo Andongo, where it grew abundantly in company with species of *Sarcostemma* and low Stapelieæ. Thus an important problem in phytogeography was conclusively solved; the genus had, however, been previously reported from extra-tropical South Africa.

The extensive rocky and dry declivities about Pungo Andongo, little susceptible of any other cultivation, would supply a ground particularly well adapted for attempting on a large scale the planting of *Opuntia* or *Nopalea coccinellifera* Salm-Dyck, which would doubtless thrive there and furnish a new and valuable article of commerce for that country. See Welwitsch, Apont. p. 556, n. 131, and Sert. Angol., p. 35.

1. **HARIOTA** Adans. Fam. Pl. ii. p. 243 (1763). *Rhipsalis* Gaertn. (1788); Benth. & Hook. f. Gen. Pl. i. p. 850.

1. **H. parasitica** O. Kuntze, Rev. Gen. Pl. i. p. 262 (1891).

Cactus parasiticus L. Syst. Nat. (ii.), edit. 10, p. 1054 (1759). *Rhipsalis Cassutha* Gaertn. Fruct. i. p. 137, t. 28, f. 1 (1788); Oliv. Fl. Trop. Afr. ii. p. 581 (*Cassytha*). *R. æthiopica* Welw. in Journ. Linn. Soc. iii. p. 152 (1859).

Golungo Alto.—A parasitical shrub, 4 to 8 ft. long or more, with glaucous-green stem and branches hanging down a long distance and growing on the mossy branches of *Edwardia lurida* and *Adansonia digitata*. In very elevated primitive forests in Sobato Quilombo-Quiacatubia, abundant; scarcely ripe fr. Feb. 1855; without either fl. or fr. July 1856. The branches throw out adventitious roots from the nodes. No. **876**. A fleshy little shrub, with nodding green-reddish branches, decked with crowded fascicles of tawny setose hairs. Young specimens, parasites on the mossy branches of *Edwardia lurida* Raf., at the same locality as the last No.; without fl. or fr. Feb. 1855. No. **877**. Coll. Carp. 620 and 620*b*.

Pungo Andongo.—A pendulous evergreen shrub, 4 to 9 ft. long and more, very much branched; stems scarcely as thick as the little finger,

sometimes rooting at the base, usually proliferous in a verticillate manner at the apex ; branches smooth, cylindrical, glaucescent-green, jointed, the younger ones squamulose ; flowers whitish, tending to a pale-sulphur colour, rather small, very crowded, lateral on the scars of fallen scales, scentless ; calyx adnate to the ovary, with a superior free unequally toothed or lobed limb ; petals 6 or 7 ; stamens about 20, about as long as the petals or a little shorter, with erect filaments and whitish anthers ; style rather thick, erect ; stigma 4-partite, with ovate-oblong, obtuse, thick, erect-spreading lobed segments ; ovary 1-celled, many-ovuled ; placentation parietal ; berry subspherical-urceolate, as large as a moderate-sized pea, from whitish to pale-yellowish, almost pellucid, scarred with the remains of the calyx-limb ; pulp viscid, investing the seeds ; seeds black, glossy, subpyriform, some almost reniform. Terrestrial, by the very high volcanic, almost vertical, rocks of the fortress of Pungo Andongo, on the south-west side, in company with orchids and species of *Sarcostemma*, not uncommon ; fl. and nearly ripe fr. beginning of Dec. 1856 ; ripe fr. Jan. 1857. No. 878.

Welwitsch obtained in April 1866 a flowering and fruiting specimen of this species cultivated in Kew Gardens from Jamaica, and, after carefully comparing it with the above Nos., satisfied himself as to the specific identity, noticing only that the Angolan plants were a little more robust.

LXVI. FICOIDEÆ.

In Angola proper a variety of *Halimum Portulacastrum* covers extensive tracts in the island of Loanda, and various species of *Mollugo* grow by sandy road sides leading into the interior and about stagnant pools in the littoral and also in the mountainous regions ; the New Zealand spinach, *Tetragonia expansa* Murr., has been introduced.

The corm-like form of rootstock in the *Psammatropha* which occurs in Huilla is very interesting, and recalls the corm-mass which occurs above the ground in several species of *Cissus* and *Pachypodium* ; this condition indicates a hot and rainless winter, the enlargement of the stem providing, as it were, winter-quarters and store-houses during the trying winter season when everything of a tender uature is scorched up or disintegrated.

In *Limeum* the presence or absence of petals can never serve for the discrimination of species, much less for divisions into sections, as used in the *Flora Capensis*, for sometimes in the same plant both apetalous and petaliferous flowers are met with ; the division into sections, according as the corymbs are sessile or pedunculate, is also of doubtful application.

It is yet to be ascertained whether all the species of *Limeum* are poisonous, or only a few of them, or possibly none ; Welwitsch noticed that *L. glomeratum* E. & Z. was eaten by oxen about Humpata. The variety *leiocarpum* of *L. viscosum* L. contains in abundance a material for producing a yellow dye.

The occurrence in Mossamedes of two species of *Mesembryanthemum* suggests a sub-tropical affinity for the flora of that district, or almost a Cape connection.

1. **MESEMBRYANTHEMUM** Dill., L.; Benth & Hook. f. Gen. Pl. i. p. 853.

1. **M. dimorphum** Welw. ex Oliv. Fl. Trop. Afr. ii. p. 582.

Mossamedes.—A glaucous succulent prostrate herb, sometimes annual and sparingly flowering, in other cases lasting two or three years or even longer, and suffruticose tortuous decumbent very rigid with numerous flowers and somewhat woody stem; flowers whitish, polypetalous, terminating the secund branchlets. In stony-sandy places near maritime rocks, from the Girâul as far as Praia da Amelia, not uncommon; fl. and fr. July 1859. No. **2377**.

2. **M. dactylinum** Welw., *l.c.*

Mossamedes.—A very succulent prostrate annual herb; root simple, filiform, penetrating deeply into the soil; stems 1 to 3 in. high, cylindrical, abbreviated, once or twice dichotomously divided into short, spreading or decumbent, leafy branches; leaves conical-cylindrical, obtuse, very turgid, terete, nearly finger-shaped, very succulent, approximated, quite smooth, 1 to 2½ in. long, broad and clasping at the base, gradually tapering towards the obtuse apex; the primordial ones decumbent, the upper ones nearly erect or erect-patent, all of them of a deep reddish brown colour; flowers solitary, subsessile, terminating the main stem and branchlets, nearly concealed between two very turgid ovoid convex obtuse erect bracts, about ½ in. in diameter, white, very small, linear, erect-patent; fruits at length concealed between the succulent bracts. In hot conglomerate sand and at the base of tertiary rocks near the sea shore between Cazimba and Cabo Negro, in company with *Tetragonia reduplicata* Welw. and some species of *Halimum*; fl. and young fr. in spring, 3 Sept. 1859. No. **2376**.

2. **TETRAGONIA** L.; Benth. & Hook. f. Gen. Pl. i. p. 854.

1. **T. reduplicata** Welw. ex Oliv. Fl. Trop. Afr. ii. p. 583.

Mossamedes.—An erect fleshy brittle undershrub, 1½ to 2½ ft. high; stem and older branches varying from yellow to whitish, striate; branches subvirgate, ascending: leaves oval, obtuse, abruptly narrowed at the base into a petiole of ½ to ¾ in. long, deep-green, delicately papillose, fleshy, brittle, nearly glabrous, in the living state distinctly doubled back along the midrib and in this way curved inwards and upwards in a falcate form, giving the plant a crisp appearance; flowers axillary, arranged in very lax reduced racemes on short or longer peduncles, yellowish-green inside; calyx densely papillose, with 4 or occasionally 3 ovate unequal obtuse very patent lobes; petals 0; stamens 12 to 20 or ∞; anthers yellow; styles 3 or 2, very thick, densely papillose on all sides, erect-patent, a little longer than the calyx-lobes; fruit 3- or 4-winged, obovoid- or depressed-globose, not nerved between the wings; wings semicircular, rounded or very obtuse at the apex of the fruit, moderately narrowed towards the base; young fruit ⅔ in. high and broad, by abortion 2- or 1-celled. Along the sandy rocks near the sea-shore between Mossamedes and Cabo Negro at A Cazimba; fl. and fr. beginning of Sept. 1859. No. **2379**.

2. **T. expansa** Murr. in Comm. Soc. Gotting. vi. Phys. p. 13, t. 5 (1785); Welw. Apont. p. 557, sub n. 132; Pax in Engl. & Prantl, Nat. Pflanzenfam. iii. pars 1, p. 44, fig. 18 (1889).

LOANDA.—An annual herb ; stems prostrate, branched to a great distance ; branchlets very crowded, ascending ; leaves glaucescent, fleshy. Indigenous in New Zealand and Japan, etc., and cultivated occasionally in kitchen gardens at Loanda, where it was introduced by Welwitsch in 1853 and throve ; Museque of Senhor Antonio Lopez da Silva, Island of Loanda, August 1858, and Museque of Senhor Schut, March 1854. New Zealand spinach. No. **2378**.

3. **AIZOON** L. ; Benth. & Hook. f. Gen. Pl. i. p. 854.

1. **A. mossamedense** Welw. ex Oliv. Fl. Trop. Afr. ii. p. 584.

MOSSAMEDES.—An annual herb, rather fleshy erect or in old age usually decumbent with repeated ramifications ; leaves alternate ; flowers deep-yellow, without petals ; stamens about 50, inserted on the throat not at the bottom of the calyx ; filaments purple, almost flattened ; styles 5 ; capsule 5-valved, 5-celled ; seeds exactly reniform, brown-black, glossy, rather compressed, with one or two furrows along the back. In sandy-rocky parts of Serra de Montes Negros ; fl. and fr. 10 August 1859. No. **2380**. A subpubescent branched rather fleshy annual herb, rather erect or prostrate-ascending ; calyx green outside, bright-yellow inside, in habit resembling a *Sesuvium* ; capsule 5-celled, dehiscent with 5 valves each of which bears in the middle a small septum laying bare the central 5-winged column. In sandy maritime places, Praia da Amelia ; fl. and fr. beginning of August 1859. No. **2380***b*. An annual herb, at first erect, soon branching and prostrate, rather fleshy papillose and glaucous-green throughout ; calyx deep-yellow inside ; stamens very numerous, in phalanges ; capsule as in Caryophyllaceæ. In sandy places by the sea near Praia da Amelia ; fl. and fr. July 1859. COLL. CARP. 117.

The following No. may be mentioned here ; it probably belongs to the same species or to *A. canariense* L. :—

MOSSAMEDES.—A subsucculent glaucous-green annual herb, branched from the base ; branches ascending ; branchlets corymbose ; petals 0 , stamens indefinite. In moist sandy places at the mouth of the river Bero, near Mossamedes, sparingly ; fl. July 1859. Only one young specimen gathered ; in June 1860 the same locality was searched in vain for more specimens. No. **1264**.

2. **A. virgatum** Welw., *l.c.*

MOSSAMEDES.—An undershrub, woody at the base, 2 to 3 ft. high, brittle, erect ; stem weak, mostly oblique ; branches virgate-sarmentose, white-silky, elongated ; sarmentose branchlets subscandent or spreading horizontally among other plants ; young parts and leaves brilliantly silvery-silky ; leaves strictly alternate ; lateral flowers not rarely abortive or reduced, and the central sessile flower in the dichotomy of the cyme the only fertile one ; calyx deeply 5-cleft, with ovate-lanceolate acuminate spreading segments, silky-pilose outside, naked and yellowish inside ; stamens indefinite, 50 to 60, inserted in rows at the middle or a little below the mouth of the calyx-tube ; filaments flattened at the base, filiform, acuminate, sometimes biseriate ; anthers oblong, with linear versatile cells ; petals 0, or very rarely represented by a few threads or by one antherless or occasionally by a 2- to 3-cleft filament : ovary free, inversely pyramidal, 5- or often 4-celled, 5- or 4-angled ; cells 1- or 2-ovuled ; styles 5 or 4, spreading in a radiate manner, deflexed, densely papillose or rather stigmatose ; flowers axillary, arranged in little dichotomous cymes, shortly pedicellate, the

capsule ob-pyramidal, truncate at the apex, 5- or 4-celled, with 5 or 4 rather thick spongy valves; cells 1- or 2-seeded; seeds pendulous from the central column, which is thickened at the apex, compressed-reniform, half surrounded by the rather long funicle, estrophiolate. In a moist sandy place at the border of a forest along the banks of the river Mălombŏ, near Páo, among short bushes, in company with species of *Lobelia*, *Heliotropium* and *Phyllanthus*, sparingly; fl. and young fr. Oct. 1859. No. **1113**.

4. **GALENIA** L.; Benth. & Hook. f. Gen. Pl. i. p. 854.

1. **G. africana** L. Sp. Pl., edit. 1, p. 359 (1753); Oliv. Fl. Trop. Afr. ii. p. 585.

Var. **pentandra**.

Leaves oblanceolate-linear, ranging up to 1 in. long by ¼ in. broad; stamens mostly only 5.

Mossamedes.—An erect very rigid shrubby herb, or a hard-woody little shrub, 1 to 2 ft. high, branched in a cæspitose-divaricate manner; leaves opposite or congested pseudo-verticillate, rather fleshy, viscid, pale-green, folded-reflexed at the apex; flowers dichotomously corymbose; calyx green-yellowish outside, rather rosy inside, with 1, 2, or 4 bracteoles, and with 5 rather obtuse hooded lobes obtusely tuberculate on the back; stamens 5, alternating with the calyx-lobes; filaments filiform; anthers didymous; ovary sessile, obovoid, 2-celled, cells 1- or rarely 2-ovuled; styles 2, erect-spreading, central, stigmatose a long way down the inner side; capsule membranous, turbinate, when fully ripe opened down to the base into 2 valves, almost always 1-seeded in consequence of one cell becoming abortive or reduced and the septum disappearing to a great extent or adhering to the wall of the capsule; seed pyriform, quite black, longitudinally densely and deeply furrowed, the lines of the furrows very delicately punctulate. In rocky sparingly-bushy places along the right bank of the river Bero, at Boca do Bero, rather rare; in late fl. and fr. June 1859. No. **1093**. An ascending or nearly erect undershrub, perhaps only biennial; stems and branches opposite, with a whitish bark; leaves rather fleshy, pale-green; flowers white. On maritime sand-rocks between Cabo Negro and Mossamedes, sparingly; not yet in good fl. 4 Sept. 1859. Apparently a young state of No. 1093. No. **1092**.

The admission of this variety necessitates the enlargement of the characters of the genus to include isostemonous flowers.

5. **HALIMUM** Loefl. It. Hisp. p. 191 (1758); non *Halimus* P. Browne (1756). *Portulacastrum* Loefl., *l.c.*, p. 106. *Sesuvium* L. (1759); Benth. & Hook. f. Gen. Pl. i. p. 855.

1. **H. Portulacastrum** O. Kuntze, Rev. Gen. Pl. i. p. 263 (*Halimus*) (1891).

Portulaca Portulacastrum L. Sp. Pl. edit. 1, p. 446 (1753). *Sesuvium Portulacastrum* L. Syst. Nat., edit. 10, ii. p. 1058 (1759); Oliv. Fl. Trop. Afr. ii. p. 585.

Ambriz.—The whole plant blood-red-purple; stems decumbent, 1 to 4 ft. long; flowers rosy. In grassy maritime sandy places at the mouth of the river Loje, near Ambriz, very abundant; fl. and fr. Nov. 1853 and 1857. No. **2383**.

LOANDA.—A succulent gregarious perennial herb, creeping a long distance; stems blood-red, prostrate, widely spreading in all directions, occupying very extensive tracts of the sea-shore and conspicuous from afar by its purple colour, the adult plant turning purple or rather red throughout, throwing out adventitious roots from the nodes; flowering branchlets ascending; leaves oblong lanceolate, very thick, rather obtuse, grass-green, scarcely glaucescent, the old ones frequently red like the stems; flowers axillary, on rather long pedicels; calyx rather fleshy, green outside, prettily rosy inside; lobes of the calyx-limb arched at the apex, mucronate at the back; stamens rosy; anthers of a bright purple-rosy colour; styles 3 (in some cases), as long as the stamens. On the sea-shore along the coast of the district, Praia de Zamba Grande to the mouth of the river Cuanza, the coast at Bispo, Island of Loanda, etc., very abundant; fl. Dec. 1858 and July 1854. No. **2384**. Leaves very thick, terete, ellipsoidal-cylindrical, in the dry state at length flat; flowers somewhat smaller than usual in the species. On the more barren parts of the sea-coast, mixed with the ordinary form, Praia de Bispo; fl. Dec. 1858. No. **2385**.

MOSSAMEDES.—A fleshy, herbaceous-green, perennial herb. By the mouth of the river Bero, abundant; fl. and fr. beginning of Aug. 1859. No. **2390**.

Var. **crithmoides**.

Sesuvium crithmoides Welw. Apont. p. 586, n. 33. *S. Mesembryanthoides* Welw., *l.c.*, p. 557 sub n. 132.

A succulent herb, normally perennial, but not uncommonly annual or biennial, fruiting and perishing like other maritime plants; rootstock thick, much divided at the crown, and giving off numerous stems of 2 to 4 ft., which are prostrate spreading in a circle, deep blood-red, rough with very crowded papillæ, and repeatedly branched; branchlets ascending, leafy; leaves compressed-cylindrical, fleshy, 1 to 2 in. long, opposite, quasi-sessile with broadly sheathing petioles, longitudinally furrowed above, very glaucous, densely papillose; flowers axillary or alar, sessile, fully open only about noon, of a very pretty rose-violet colour inside; calyx furnished at the base with 5 ovate bracteoles alternating with its segments, shortly funnel-shaped; calyx-segments 5, longer than the calyx-tube, thick, of a rose-violet colour inside, arched-mucronate at the apex; sinuses acutely prominent, pungent: petals 0; stamens very numerous, irregularly and equally inserted at the throat of the calyx; filaments filiform, unequal in length; anthers ellipsoidal, 2-celled, dehiscing longitudinally; ovary free, ovoid-conical, truncate at the apex, 5-celled; ovules several in each cell, inserted on the central axis by distinct funicles; styles 5, erect, rather thick-filiform, longer than the ovary, narrowly capitate with the stigmas; capsule chartaceous, ovoid-conical, circumsciss, tumid about the line of dehiscence; lid truncate-conical; seeds several, globose-obovoid, appendaged at the insertion of the funicle almost as the seeds in *Hypoxis*, very black, smooth. Flowering almost throughout the year.

BARRA DO DANDE.—A beautiful, apparently perennial herb; stems deep blood-red, prostrate, spreading in a circle; leaves fleshy, glaucous, semi-cylindrical; flowers of a pretty rose colour, rather large for the

genus ; seeds black, glossy. On the sea-sands of Praia de San Thiago ; fl. and fr. Sept. 1853. The specimens were lost in crossing the river Bero.

Loanda.—A glaucescent herb, the whole plant, but especially the stems, turning red, annual but somewhat shrubby ; stems diffuse, 2 to 4 ft. long, dichotomously branched, arranged in a circle ; leaves linear, thick, very glaucous, fleshy, brittle, pale-green ; flowers deep-violet or purplish ; calyx-lobes densely papillose and green outside, rosy inside ; styles 3 or 4, filiform ; capsule pyramidal, truncate at the apex. In gravelly sea-sands of the island of Loanda in company with *Scævola Lobelia* L. (Welw. Herb. No. 1137) ; fl. and fr. Dec. 1853, July 1854, and 12 June 1858 ; island of Cazanga to the south of Loanda ; fl. and fr. 30 April 1854 and Oct. 1854. Abundant. No. **2386**. A perennial plant, well worth cultivating ; stems deep purple-red, prostrate in a circle ; leaves semicylindrical, fleshy glaucous ; flowers rosy, usually rather large. In sandy places in the island of Loanda ; fr. Feb. 1858. Coll. Carp. 160.

2. **H. congense** O. Kuntze, *l.c.* (*Halimus congensis*) (1891).
Sesuvium congense Welw. ex Oliv. Fl. Trop. Afr. ii. p. 586.

Ambriz.—A very rigid low almost suffruticose herb, with the habit of a Mesembryanthemum, very much and diffusely branched from the base, prostrate ; branches cylindrical, tortuous, minutely papillose as well as the branchlets; shoots ascending, subsecund; leaves fleshy, linear or nearly worm-shaped, strongly involute on the margin, green-glaucescent, fasciculate-crowded; flowers small, subsessile, bright-rosy inside ; petals 0 ; stamens numerous ; lid of the capsule conical-umbonate. In rocky places and in gravel in mountainous places along the estuary of the river Onço in Mossul, near Ambriz, abundant ; fl. and fr. Nov. 1853. Collected in flight under pursuit by a party of Mossul negroes. No. **2382**.

3. **H. mesembrianthemoides.**
Sesuvium mesembrianthemoides Wawra in Wawra & Peyr. in Sitz. Akad. Wien, xxxviii. p. 564 (1860). *S. crystallinum* Welw. ex Oliv., *l.c.* *Halimus crystallinus* O. Kuntze, Rev. Gen. Pl. i. p. 263 (1891).

Mossamedes.—A prostrate suffruticose herb, perennial or sometimes apparently annual, forming large clumps, the whole plant in the living state densely covered with rather large watery-glassy papillæ, very beautiful in the manner of *Mesembryanthemum crystallinum* L. ; stem cylindrical, jointed ; leaves opposite, fleshy, terete, marked with one furrow on the upper face, hoary-papillose, and thus appearing very glaucous ; petioles short, sheathing the stem ; flowers deep-rosy inside; styles 4 ; capsule 4-celled ; seeds helix-shaped. In sandy gravelly situations along the seashore near Mossamedes, very abundant ; fl. and fr. beginning of July 1859. No. **2389**.

The following No. is doubtfully referred here :—

Mossamedes.—A succulent green minutely papillose herb, with the habit of this genus or of Portulacaceæ. In sandy places at the seaside, near Cabo Negro ; not yet in fl. Sept. 1859. No. **2387**.

4. **H. sesuvioides** O. Kuntze, *l.c.* (*Halimus sesuvioides*) (1891).
Diplochonium sesuvioides Fenzl, Nov. Stirp. Dec. (vii) p. 58 (30 June 1839). *Sesuvium digynum* Welw. ex Oliv. *l.c.*

Var. **reduplicatum** (Welw. ms. in Herb).

MOSSAMEDES.—A prostrate fleshy glaucous-green annual herb, branched from the base, sometimes scarcely 2 in. long, in other cases quasi-scandent among shrubs almost 3 to 4 ft. long; leaves lanceolate, rather rigid, mostly turning purple or dark-red, the blade folded back along the length of the midrib or occasionally contorted; flowers as in *Halimum*, purple; styles 2. In moist sandy places at the base of Serra dos Montes Negros, about 6 to 8 miles from the sea; also at the banks of the river Bero; fl. and fr. 10 Aug. 1859. No. **2391.** Styles 2. In rather elevated hilly sandy places between Cazimba and Caroca, near Cabo Negro, in company with *Tumboa Bainesii* Hook. f., sporadic; fl. and fr. beginning of Sept. 1859. No. **2388.**

Var. **Welwitschii.**

MOSSAMEDES.—An annual biennial or triennial herb, glaucescent, sometimes prostrate with stems of a few inches, in other cases subscandent among shrubs with a much-branched stem of 4 ft.; flowers rose-purple; calyx-sinuses cornuate outside; styles 2, elongated, erect from an ascending base. In sandy thickets at the banks of the river Bero near Cavalheiros, in company with an amphibious species of *Marsilea*; fl. and fr. July 1859. No. **2392.** In the hot sand along the banks of the river Mãĩombŏ; fl. and fr. 12 Oct. 1859. No. **2394.**

Var. **angustifolium** (Schinz in Bull. Herb. Boiss. v. App. iii. p. 74 (April 1897)).

Diplochonium sesuvioides Wawra & Peyr. in Sitz. Akad. Wien, xxxviii. p. 564 (1860).

BENGUELLA.—An annual or biennial herb, branched from the base, at first rather erect and corymbosely branched, soon with lateral divaricate very patent branches; stems and older branches mostly yellowish-white, purplish when young; branches always dichotomous; leaves rather fleshy, flat, glaucous-green, sometimes linear-filiform or linear or almost linear-lanceolate, acute, in other cases broader and exactly lanceolate: flowers axillary, sessile, solitary, bright-rosy inside; calyx-lobes gradually and much acuminate, more so than usual in species of *Halimum*; sinuses folded into cornua outside; ovary 2-celled; styles 2, elongated, straight or ascending; capsule 2- or rarely 1-celled; seeds helix-shaped, dull, transversely and roughly rugose on both sides. In bushy sandy maritime places along the sides of streams between the river Cotumbella and the rivulet Cavaco near the city to Benguella; fl. and fr. June 1859. No. **2393.**

MOSSAMEDES.—Flowers rosy. In sandy stony places along the banks of the river Mãĩombŏ, at Páo, in company with *Phyllanthus mossamedensis* Welw. and a species of *Lobelia*; fl. and fr. Oct. 1859. No. **2395**

6. **TRIANTHEMA** Sauv., L.; Benth. & Hook. f. i. p. 855.

1. **T. crystallina** Vahl, Symb. Bot. i. p. 32 (1790); Oliv. Fl. Trop. Afr. ii. p. 587.

MOSSAMEDES.—An annual, prostrate, rather glabrous herb; stem slender, brittle, weak, whitish-green or bright-purple, dichotomously or trichotomously branched, occasionally furnished with minute papillæ; leaves rather fleshy, sometimes turning purple, falling off in course of drying; stem-leaves spathulate; floral-leaves obovate-ellipsoidal or suborbicular; calyx rosy inside, 5-cleft; lobes arched-subulate; corolla 0; stamens 5, alternating with the calyx-lobes; filaments filiform; anthers orange-coloured, rather broadly didymous;

ovary attenuate at the base, 1-celled, 2-ovuled ; style 1, erect, arising from the centre of the truncate apex of the ovary ; capsule turbinate, truncate, opening in a circumscissile manner ; seeds 2, lenticular-subreniform, black, delicately furrowed on both sides, superposed, the lower one usually reduced or at least much smaller than the upper one. In gravelly hilly maritime places at Praia da Amelia, near the town of Mossamedes, among specimens of a leafless *Euphorbia*, abundant, fl. and fr. July 1859. No. **1090** and Coll. Carp. 237.

Var. **sedifolia.**

T. sedifolia Visiani, Pl. Ægypt. ac Nub. p. 19, t. 3, f. 1 (1836), in Spongia, Comm. Med. ii. p. 204 (Aug. 1836), Oliv., *l.c.*, p. 588.

Mossamedes.—Always prostrate, rigid, brittle ; leaves linear-oblong ; stamens purplish ; flowers greenish-yellow ; calyx-lobes arched-conical ; petals 0 ; stamens 5, alternating with the calyx-lobes ; ovary 1-celled ; style very shortly bifid-stigmatose at the apex, sometimes almost undivided ; capsule circumsciss. In hilly sandy maritime places near Praia da Amelia, rather rare ; fl. and fr. July 1859. No. **1089** and Coll. Carp. 236.

7. **ORYGIA** Forsk. ; Benth. & Hook. f. Gen. Pl. i. p. 856.

1. **O. decumbens** Forsk. Fl. Ægypt.-Arab. p. 103 (1775) ; Oliv. Fl. Trop. Afr. ii. p. 589.

Mossamedes.—A perennial herb ; rhizome thick, woody ; stems decumbent-ascending, turning purple or rosy ; leaves alternate, glaucous, rather fleshy ; capsule suggesting Caryophyllaceæ. By red sand-rocks near Boca do Rio Bero, rather rare : in advanced fr. without fl. July 1859. No. **2418.** A long-rooted perennial herb ; primary stem decumbent, as well as the branches whitish or purplish ; branches angular, brittle ; leaves rather fleshy, glaucous, elliptical, attenuate at both ends ; calyx green with purple margins, 5-partite ; capsule almost as in *Hypertelis* E. Mey., 5-celled, 5-valved ; seeds reniform. In dry stony places near Ladeira dos Arrependidos between Mata dos Carpenteiros and Páo, sparingly ; fr. and late fl. June 1860. No. **2418***b*.

8. **MOLLUGO** L. ; Benth. & Hook. f. Gen. Pl. i. p. 857.

1. **M. hirta** Thunb. Prodr. Pl. Cap. (i.) p. 24 (1794).

Glinus lotoides Loefl. It. Hisp. p. 145 (1758) ; Fenzl. in Ann. Wien. Mus. i. p. 357 (1838). *M. Glinus* A. Rich. Fl. Abyss. i. p. 48 (1847) ; Oliv. Fl. Trop. Afr. ii. p. 590.

Loanda.—An annual much branched herb ; branches prostrate, 2 to 4 ft. long, spreading in a circle ; leaves rather wavy and more tomentose in dried-up swamps than in marshes. By nearly dried-up swamps and at the edges of lakes near Alto das Cruzas (also at the lake Quilanda in Zenza do Golungo), abundant ; fl. and fr. beginning of Sept. 1857. No. **2412.** An annual, prostrate, hoary or softly shaggy herb ; anther-cells separate except their middle, where they are inserted on the filament by means of the narrow transverse connective. In a few flowers the calyx was hexamerous, with the interior segments quite petaloid pale-yellowish and ovate-lanceolate like the other segments. Staminodes bipartite. About swamps to the south of the city of Loanda, between Bemposta and Camama ; fl. and fr. end of March 1858. No. **2414.**

Barra do Bengo.—In muddy-sandy pastures flooded in summer, near Panda, by the river Bengo, rather rare ; fl. and fr. Dec. 1853.

No. **2415**. A succulent prostrate annual herb. On sandy somewhat salt gravel by the lake Quisequella ; in fl.-bud, Dec. 1853. Only one specimen found, apparently belonging to this species. No. **1265**.

Mossamedes.—An annual prostrate herb, branched from the base. In damp sandy places near the banks of the river Bero, abundant ; fl. and fr. July 1859. No. **2413**. White-tomentose, by pools nearly dried up, near Cavalheiros ; fl. June 1860. No. **2413***b*. Branches prostrate, spreading in a stellate manner, clothed with a snow-white felt, as are also the leaves, which are very much nerved on the back. In sandy muddy places by dried-up pools along the banks of the river Caroca near Cabo Negro ; fl. and fr. Sept. 1859. No. **2416**.

Var. **virens** (Fenzl, *l.c.*, p. 358 ; Oliv., *l.c.*, p. 590).

Pungo Andongo.—A prostrate herb ; stems elongated, with rambling branches, 2 to 3 ft. long. By a nearly dried-up swamp between Condo and Quisonde, in a wooded place ; fl. and fr. end of March 1857. Only one plant seen ; all the specimens were mutilated by oxen rushing to the swamp in search for water ; they all had uniform leaves, of the same size and shape, from the top to the bottom. No. **1111**.

2. **M. oppositifolia** L. Sp. Pl. edit. 1, p. 89 (1753) ; Trimen, Fl. Ceyl. ii. p. 271 (1894).

M. Spergula L. Syst. Nat., edit. 10, ii. p. 881 (1759) ; Oliv. *l.c.*

Loanda.—A herb apparently lasting for several years but certainly also annual ; root rather thick, fleshy-woody, descending vertically, giving off numerous divisions from its crown ; stems very numerous, branched, prostrate, spreading in a circle, ascending at the apex ; leaves herbaceous-green, but little fleshy ; flowers greenish ; calyx-segments 5, obtuse, keeled, erect ; corolla 0 ; stamens included, 8 ; filaments filiform ; anthers oblong-rectangular, 2-celled ; cells linear, separate except in the middle where they are joined by the connective and inserted on the filament ; ovary triquetrous, turgid, included ; stigmas 3, sessile, diverging ; capsule 3-celled, loculicidally 3-valved ; seeds numerous, subreniform, fuscous-red, marked in rows with minute dense raised points or tubercles, scarcely strophiolate, half-surrounded by a white funicle. By rain-pools drying up at the time, near Alto das Cruzes, abundant, fl. and fr. April 1854 ; at the pond (repressa), Museque de Luis Gomes, fl. and fr. Aug. 1854. No. **1109**. An annual herb, with the habit of a *Cerastium* or *Alsine* ; stems numerous, filiform, sparingly dichotomous, furrowed, shortly pilose, 4 to 9 in. long, erect or ascending-erect ; whorls of the rather fleshy bright-green leaves distant ; peduncles whorled, capillary, $\frac{1}{2}$ to $\frac{3}{4}$ in. long, erect in flower, nodding in fruit ; flowers from white to greenish ; calyx-segments thickly and acutely keeled ; filaments 3, 4, or 5, subulate, not short ; capsule elongated-ellipsoidal, deeply 3-furrowed, crowned with 3 stigmas ; seeds turgid. Around rain-pools on clay among short grass near Museque de Luis Gomes, in the southern plain above Loanda, very abundant, but seen in only one locality ; fl. and fr. 10 Jan. 1858. Not seen in 1853 or 1854. No. **2409** and Coll. Carp. 623. By dried-up pools near Museque do Senhor Schut above Loanda ; fl. and fr. June 1854. Rather small specimens. No. **2409***b*.

Barra do Bengo.—An annual, prostrate-diffuse herb. In muddy places previously flooded at the banks of the river Bengo near Quifandongo, sparingly ; fl. and fr. Sept. 1854. No. **1071**.

Barro do Dande.—An annual herb, with the habit of a *Cerastium* ; at the edges of pools along the right bank of the river Dande, near Bombo, sparingly : fl. and fr. end of Sept. 1858. No. **1112**.

CALUMBO.—A herb, apparently annual or biennial; stems prostrate, spread out in a stellate manner. In rich muddy-sandy pastures flooded in summer, by dried-up pools between Bemposta and Camama by the road towards Calumbo, fl. abundant; fl. and fr. July 1854. No. **1110**.

3. **M. nudicaulis** Lam. Encycl. Méth. iv. p. 234 (1795–96); Oliv., *l.c.*, p. 591.

M. bellidifolia Ser. in DC. Prodr. i. p. 391 (1824); Welw Apont. p. 591, n. 101.

AMBRIZ.—Habit of an *Alisma*; radical leaves rather fleshy, patent, subglaucescent; filaments subulate; seeds globose-compressed, uniangular; testa crustaceous, granulated, brown-black. In damp cultivated places and sandy thickets around negro villages, near Quizembo; fl. and fr. Nov. 1853. No. **2396**.

LOANDA.—An annual herb; leaves radical, rosulate, green, rather fleshy; scapes rather erect, smooth, mostly turning red, primary branches 4, all the branches furnished at the base with a white scarious bract; calyx 5-parted nearly to the base, segments concave, keeled, obtuse, reddish outside, white inside; stamens usually 3, rarely 4, very rarely 6; stigmas 3, sessile, horizontally divaricate, broadly lanceolate, whitish, very delicately fringed. In fields formerly cultivated, abundant where found, but almost every year appearing in another spot, in fertile places flooded in summer; fl. chiefly from Oct. to the end of June; near Penedo, 27 Dec. 1857. No. **2397**. At the well close to Welwitsch's house in the middle of the town of Loanda; fl. and fr. Nov. 1860. No. **2397***b*.

CAZENGO.—Annual in hot rather dry sparingly grassy places and in rocky places, at the river Luinha, fairly abundant though in but few spots; both young and old plants together; about 1200 ft. altitude; fl. and fr. Dec. 1854. No. **2398** and COLL. CARP. 621.

AMBACA.—At the muddy bank, almost dried up, of the river Caringa; fl. and fr. June 1855. No. **2399**.

GOLUNGO ALTO.—An erect annual herb, 3 to 5 in. high; leaves radical, rosulate, obovate-spathulate; flowers white, small. In places formerly cultivated near Canguerasange; fl. and fr. Aug. 1857. COLL. CARP. 622.

PUNGO ANDONGO.—In rocky places near Cabondo in the fortress; sporadic; fl. and fr. Feb. 1857. No. **2400**.

4. **M. Cerviana** Ser. in DC. Prodr. i. p. 392 (1824); Oliv., *l.c.*

AMBRIZ.—A very slender plant, growing after the fashion of a *Spergula*, glaucous-purplish on its stems and leaves; radical leaves narrowly linear, never spathulate; umbels sessile; flowers whitish. In fields between Ambriz and Mubango, near the latter place, in spots flooded in summer; fl. and fr. Nov. 1853. No. **2404**.

BARRA DO DANDE.—A very elegant little plant, representing in tropical Africa *Erophila præcox* DC.; radical leaves rosulate, glaucous; flowers whitish. In fields on sandy clay between Barra do Dande and Barra de Lifune, abundant; fl. and fr. beginning of Nov. 1853. No. **2401**.

LOANDA.—Stems shining, smooth, mostly reddish, capillary, usually when old very intricately intermixed; radical leaves obovate or spathulate, glaucous, rather fleshy; stem-leaves verticillate, 3 to 7 together in each whorl; flowers greenish-purple outside, whitish inside; seeds reniform, fuscous-red. In damp sandy places, and also in quite dry places, above the city of Loanda, near country houses

almost everywhere; fl. and fr. end of Nov. 1857. No. **2402**. In sandy places near Cabo Lombo; fr. 30 April 1854. COLL. CARP. 625.

PUNGO ANDONGO.—A very tender glaucous annual herb; branches very patent; flowers white; umbels sessile. In sandy places along the river Cuanza from Candumba as far as Quisonde, growing in dense masses; fl. and fr. Jan. to March 1857. No. **2405**.

MOSSAMEDES.—A very slender annual herb; stems purplish; flowers white. In hilly maritime places between the town of Mossamedes and Praia da Amelia, abundant; fl. and fr. end of June 1859. No. **2403**.

HUILLA.—Radical leaves linear; umbels sessile. In fields formerly cultivated about Bança de Lopollo, in damp places, always in company with small Cyperaceæ and Eriocaulons, quickly disappearing; fl. and fr. Jan. 1860. No. **2406**.

5. **M. verticillata** L. Sp. Pl., edit. 1, p. 89 (1753); Oliv., *l.c.*

Var. **longifolia** St. Hil. Fl. Bras. ii. p. 170 (1829).

Var. *linearis* Fenzl in Ann. Wien. Mus. Nat. i. p. 377 (1838); Oliv., *l.c.*, p. 591. *M. Schrankii* Ser., *l.c.*, p. 391.

LOANDA.—An annual herb, erect or ascending-erect; radical leaves crowded, rosulate; internodes very pronounced; peduncles bulbous-tumid at the base, arranged in sessile umbels; calyx-segments pervaded with one or two obscure nerves besides the keel; styles tolerably elongated for the genus. In sandy maritime places in the island of Loanda, at Museque do Senhor Antonio Lopes de Silva, abundant, but not to be found in the same spot every year; fl. and fr. 12 Jan. 1858, and more robust in the same locality at end of Feb. 1858. In drier situations the whole plant turns red. No. **2410**. In the same locality, less abundant; fl. and fr. 2 Oct. 1853. No. **2410***b*. A small herb, apparently lasting for several years. In gravelly places densely covered with *Tribulus terrestris* L. in the island of Cazanga, between Loanda and the mouth of the river Cuanza; fl. and fr. Oct. 1853. No. **2411**.

6. **M. fragilis** Wawra ex Wawra & Peyr. in Sitz. Akad. Wien, xxxviii. p. 565 (1860): Oliv., *l.c.*, p. 592.

AMBRIZ.—Apparently perennial, or at least lasting for several years. In hilly gravelly places near the town of Ambriz, abundant; fl. and fr. Nov. 1853. No. **2407**.

LOANDA.—A small herb, perennial or rarely only biennial; root simple, long, ascending vertically, woody when old; stems numerous, filiform, orange-red, strongly prostrate, spreading in a circle, dichotomous or verticillately trichotomous; leaves verticillate, obovate-spathulate, glaucous; pedicels umbellate, involucrate, equalling thin common peduncle; calyx-segments broadly white-membranous, obtuse. The whole plant delicately pruinose. In sandy maritime places near the city of Loanda, and especially about the island of Loanda, abundant and occurring nearly throughout the year; fl. and fr. Dec. 1853 and Jan. and Feb. 1858. No. **2408**.

9. **PHARNACEUM** L.; Benth. & Hook. f. Gen. Pl. i. p. 857.

1. **P. salsoloides** Burch. Trav. S. Afr. i. p. 286, n. 1508 (1822).

P. verrucosum Eckl. & Zeyh. Enum. (ii.) p. 286 (1836); Oliv., *l.c.*, p. 592. *Hypertelis verrucosa* Fenzl in Ann. Wien. Mus. ii. p. 262 (1840).

Var. **mossamedense** (Welw. ms. in Herb.).

An annual herb, or sometimes lasting two or three years,

suffrutescent, scarcely a hand high, wholly violet-grey; stems numerous, decumbent-ascending; leaves fleshy, almost terete, like those of a *Sedum*, linear, rather obtuse, muticous, glaucous, rather purplish, bistipulate at the base, subamplexicaul; stipules scarious, whitish; warts on the foliage, and inflorescence sometimes plentiful, in other cases scarcely conspicuous or rare or altogether absent; flowers apetalous; calyx prettily rosy or red, the three inner segments smaller, more coralline, and not so broadly membranous on the margin as the two outer ones; stamens mostly 7, rarely more numerous, or in short-stalked flowers only 1; anthers broadly oblong; ovary 1 to 5-celled; styles 3 or 5, recurved; placentation axile; seeds indefinite, pear-shaped. At the base of the long rays of the umbel there are sometimes 1 to 3 almost sessile flowers with a single effete stamen and an abortive ovary.

Mossamedes.—In sandy seaside situations near the town of Mossamedes, abundant; fl. and fr. June and July 1859. No. **2381**, and Coll. Carp. 624. On the sands of the coast near Mossamedes; fl. July 1859, fr. June 1860. Coll. Carp. 238.

10. **PSAMMOTROPHA** Eckl. & Zeyh.; Benth. & Hook. f. Gen. Pl. i. p. 858.

1. **P. myriantha** Sond. in Harv. & Sond. Fl. Cap. i. p. 147 (1860).
Var. *huillensis* Welw. ex Oliv. Fl. Trop. Afr. ii. p. 593.

Huilla.—A herb, at first sight seeming annual, but with a fleshy-thickened perennial rootstock bearing a rosette of leaves at its apex; when young with quite the habit of an *Androsace*; stems weak, sometimes decumbent-ascending, in other cases almost erect, mostly rubicund; branches thickened at the distant nodes; leaves lanceolate, rather fleshy, glaucous-lepidote, collected in half-whorls, rather flaccid; flowers apetalous, greenish; calyx deeply 5-cleft; segments rather obtuse, white-membranous at the margin, imbricate in æstivation; corolla 0; disk rudimentary; ovary pentagonal, 5-celled; cells 1-ovulate; style firm; stigmas 5, connivent in flower, soon radiate-patent; capsule globose-pentagonal, 5-celled, 5-valved, foveolate-impressed at the apex, angles rather acute; cells 1-seeded; seeds globose, granulated outside. In sandy grassy thickets along the road from the lake Ivantâla towards Quilengues, near Lopollo and Monino, abundant; fl. and fr. Feb. 1860. No. **2417**.

I follow Oliver in referring this number as above, but its characters are intermediate between those of *P. myriantha* Sond. and those of *P. androsacea* Fenzl in Ann. Wien. Mus. ii. p. 265 (1840), and it might be considered as a variety of the latter and older species; in fact, the two species are probably not distinct.

11. **GISEKIA** L.; Benth. & Hook. Gen. Pl. i. p. 859.

1. **G. pharnacioides** L. Mant. Pl. alt., p. 562 (*Gisechia*) (1771); Oliv. Fl. Trop. Afr. ii. p. 593 (*pharnaceoides*).

Loanda.—An annual, prostrate, rather fleshy herb; stems quadrangular, purplish, dichotomously or trichotomously branched, spreading radiately over the ground, leaves opposite, rather fleshy, glaucous, lanceolate, whitish-papillose beneath; peduncles and pedicels brac-

teate; calyx 5-partite, green outside, coralline inside, rosy; segments imbricate, concave, connivent in a campanulate manner, persistent; corolla 0; stamens 5, alternating with the calyx-segments, included; filaments greatly dilated at the base, abruptly acuminate; anthers globose, erect, 2-celled; ovaries 5, sessile, half-ovate, connivent, somewhat compressed, each bearing on the axile side the erect cylindrical whitish filiform style stigmatose at the apex; carpels 5, distinct, obovoid, somewhat compressed, muriculate especially on the back, indehiscent, 1-seeded; seed obovoid, with a shining black testa. In sandy maritime stations about the islands situate between the city of Loanda and the mouth of the river Cuanza, as, for instance, the islands of Loanda and Cazanga, abundant; Cazanga island, fl. and fr. 14 March 1858. No. **2428**. An annual, rather fleshy, prostrate herb; leaves opposite, rather fleshy, marked beneath with raised whitish lines, that is, with very crowded adpressed setulæ, cartilaginous-serrulate on the margin; flowers greenish-rosy, apetalous, pentandrous; carpels 5, distinct, membranous, crested-muriculate, utricle-like, monospermous. In exposed sandy places by thickets near Teba, abundant; fl. and fr. Jan. and Feb. 1854. No. **2429**.

Pungo Andongo.—At the sandy banks of the river Cuanza, near Candumba, between it and Muta-Lucala; fl. and fr. Jan. 1857. No. **2434**.

Var. **pedunculata** Oliv., *l.c.*, p. 594.

G. linearifolia Schum. & Thonn. in Dansk. Vidensk. Selsk. iii. p. 187 (1828).

Pungo Andongo.—A small, annual, pale, glaucous-green herb, branched from the base; stems prostrate; branchlets ascending; flowers pale rosy, In exposed sandy damp places, among short grasses, at the banks of the river Cuanza, near Muta-Lucala, abundant; fl. and fr. March 1857. No. **2430**.

Huilla.—Midrib of the leaves obsoletely pinnate; flowers rosy, pedicellate, not always in pedunculate umbels. In fields sown with *Sorghum* and *Penicillaria*, between Lopollo and Humpata: fl. and scarcely ripe fr. Dec. 1859. No. **2432**.

Var. **congesta** Oliv., *l.c.*, p. 594.

G. congesta Moq. in DC. Prodr. xiii. 2, p. 28 (1849).

Ambriz.—A usually annual herb, but with the copious spring rains biennial; stems prostrate; leaves glaucescent, rather fleshy; flowers rosy. In exposed hilly places covered with sand, among short grasses, not far from the sea, near the city of Ambriz, on the left bank of the river Loge, sparingly; fl. and fr. Nov. 1853. No. **2436**.

Loanda.—A very slender, prostrate-ascending herb, with angular stems. In sandy grassy places, not rarely flooded in summer, near Penedo, in company with species of *Boerhaavia*; fl. and fr. Jan. and end of Feb. 1858. No. **2433**.

Mossamedes.—A very slender annual herb; flowers in little heads which are sessile in the forks of the stem and branches or terminal at the tips of the ultimate branchlets and spuriously long-pedunculate, rosy. In gravelly hilly places between the town of Mossamedes and Praia da Amelia, very sparingly; fl. and fr. July 1859. No. **2427**. Near Cazimba, with sparse herbage and with species of *Atriplex*; fl. and fr. No. **2427***b*.

2. **G. Miltus** Fenzl Nov. Stirp. Dec. (x.) p. 86 (5 August 1839); Oliv. Fl. Trop. Afr. ii. p. 594.

Miltus africana Lour. Fl. Cochinch. p. 302 (1790).

PUNGO ANDONGO.—An annual prostrate herb; stem and leaves mostly blood-red; flowers white. In sandy, sparingly grassy places on the right bank of the river Cuanza, near Sansamanda, abundant; fl. and fr. 7 Feb. 1857. No. **2431**.

Var. **pedunculata** Oliv., *l.c.*, p. 594.

Gisekia aspera Kl. in Peters, Mossamb. Bot. (i.) p. 136 (1862).

MOSSAMEDES.—A prostrate annual herb, much branched from the root, dichotomous; calyx bright-rose inside, pale-rose outside. In moist sandy places by Bocca do Rio Bero, sporadic; fl. and fr. end of July 1859. No. **2435**. A diffuse annual herb, much branched from the base, with red flowers (calyx). In sandy places at the borders of Mata dos Carpenteiros, in company with *Tamarix orientalis* Forsk., etc., sparingly; fl. and fr. August 1859. No. **2435***b*. An annual herb, branched from the base; stems and branches prostrate; leaves fleshy, glaucous-pruinose, obovate or oblong or even linear-elliptical; flowers very prettily rosy; petals 0; stamens 11 or 12; carpels 5 to 7. In damp sandy places at the mouth of the river Bero; fl. and fr. end of June 1859; also 4 weak specimens at Praia da Amelia, in company with *G. pharnacioides* L., var. *congesta* Oliv. No. **2437**.

12. **LIMEUM** L.; Benth. & Hook. f. Gen. Pl. i. p. 859.

1. **L. viscosum** Fenzl Nov. Stirp. Dec. (x.) p. 87 (5 August 1839); Oliv. Fl. Trop. Afr. ii. p. 595.

MOSSAMEDES.—A small inelegant annual herb, glandular-viscid throughout; stems diffuse or oblique; branches orange-coloured; flowers greenish; sepals with broad margins; cocci plane-convex, scrobiculate on the back. In dry gravelly places at the dried-up banks of the river Bero and along the sea-coast near Praia da Amelia; fl. and fr. end of June 1859. No. **2419**.

HUILLA.—Rootstalk thick, deeply penetrating the soil, giving off several prostrate-ascending angular stems. In fields sown with a species of *Penicillaria*, near Lopollo, scarce; fl. and fully ripe fr. Jan. 1860. A form or variety less glandular than the type. No. **2423**.

Var. **hispidulum** (Welw. ex) Oliv., *l.c.*, p. 596.

MOSSAMEDES.—The whole plant, especially the stems and branches beset with rather rigid straight patent hyaline hairs glandular at the tip, hispidulous, slightly stinging; stems prostrate, ascending at the apex, 1 to 2 ft. long; flowers rather small, arranged in lax long-pedunculate corymbs terminal on the branchlets. In sandy-gravelly places with sparse herbage along the banks of the river Bero, not at all abundant, perhaps more frequent in the summer; fl. and fr. July 1859. No. **2426**.

Var. **leiocarpum** Oliv., *l.c.*, p. 596.

MOSSAMEDES.—An annual, prostrate-ascending herb, covered all over with short straight hairs glandular at the tip, puberulous; leaves narrowly oblong-lanceolate; petiole rather long; calyx densely glandular; sepals without nerves, broadly membranous on the margins, obtuse; petals usually wanting but occasionally 1 or 2, lanceolate, very acute and fugacious because very tender; stamens in most cases 7; style short, bifurcate from the middle; cocci hemispherical, shorter than the sepals, one of them usually abortive, from

orange to brown (perhaps not quite ripe), nearly smooth or very minutely granulated, the sides convex and remotely ribbed, the ribs more raised towards the margin. In a sandy-gravelly place near the sea-coast at Sacco de Giraûl, only one plant seen, in mid-winter, in company with a species of *Cressa* L. ; fl. and fr. July 1859. No. **2420**. In gravelly maritime places by the mouth of the river Caroca near Cabo Negro ; fl. and fr. Sept. 1859. No. **2420***b*. The whole plant, even in the living state, tinged with a yellow or orange colour ; stems prostrate, spreading in a circle. In very dry sandy places near Quipola, about three miles distant from the sea, sparingly ; fl. and fr. August 1859. No. **2421**.

2. **L. glomeratum** Eckl. & Zeyh. Enum. Pl. Afr. (ii.) p. 288 (Jan. 1836).

L. Meyeri Fenzl in Ann. Wien. Mus. i. p. 342 *note* (1836?) ; Oliv., *l.c.*, p. 596.

Huilla.—A prostrate, annual or biennial herb, spreading diffusely ; stems greenish-yellow, tenacious ; leaves grass-green, somewhat glaucous and fleshy ; petals 3 in some cases, obovate-cuneate, clawed ; stamens 7, all fertile ; anthers yellow. In fields on a sandy-clay soil, between Lopollo and Humpata ; fl. and ripe fr. Dec. 1869. No. **2422**.

3. **L. linifolium** Fenzl, *l.c.* ; Oliv., *l.c.*

Mossamedes.—An annual prostrate glaucescent herb ; stems branched at the apex, brittle ; leaves rather fleshy ; calyx whitish with green nerves. In sandy places by Mata dos Carpenteiros with *Tamarix orientalis* Forsk. and *Euclea pseudebenus* E. Mey., and at the banks of the river Bero near Cavalheiros ; very scarce ; fl. and fr. August and end of June 1859. No. **2425**.

Var. **polygonoides** (Welw. ex) Oliv., *l.c.*, p. 596.

L. argute-carinatum Wawra ex Wawra & Peyr in Sitz. Akad. Wien, xxxviii. p. 563 (1860).

Mossamedes.—An annual herb, prostrate, glabrous and highly glaucous throughout, dichotomously branched, brittle in the living state, at least when old, very much so in the dry state, pretty on account of its glaucous bloom and milk-white corymbs, in habit resembling a species of *Polygonum* ; sepals milk-white, green-glaucous along the acute keel, subcucullate-apiculate at the apex, very broadly membranous on the margin ; petals always present, usually 2 or 1, narrowly spathulate, $\frac{1}{2}$ to $\frac{3}{4}$ as long as the sepals, very tender, milk-white ; stamens usually 7 ; style rather long, bifurcate at the apex or in some cases deeply so, fugacious ; cocci elevato-hemispherical, blackish, tenacious, all over except their excavated base beset with short conical obtuse straight tubercles, always shorter than the sepals. In sandy places along the banks of the river Bero near Cavalheiros, among short herbage, 6 to 8 miles distant from the sea, not abundant ; fl. and fr. June and July 1859. No. **2424**.

The following No. should be compared with this species :—

Pungo Andongo.—A very slender erect annual herb, 3 in. high ; stem filiform, a little branched in the upper part ; leaves alternate ; flowers very small. In a moist pasture on the right bank of the river Cuanza, in company with species of *Isoëtes* and *Drosera* ; only one specimen in fl. bud, 22 Feb. 1857. No. **6751**.

LXVII. UMBELLIFERÆ.

This natural order is generally but poorly represented in the tropics.

The carrot generally is cultivated in gardens in Angola proper and in Mossamedes, especially in the mountainous and highland regions, and is occasionally semi-spontaneous; the "Herva doce" of the Portuguese, *Pimpinella Anisum* L., is occasionally cultivated, as for instance near Quicuxe in the Loanda district, and also in Benguella. *Cuminum Cyminum* L. was nowhere seen by Welwitsch in Angola.

The genus *Hydrocotyle* is transferred by some botanists to Araliaceae, principally because the æstivation of the corolla is valvate rather than imbricate as is usual in Umbelliferæ. This circumstance, Welwitsch remarks, only proves that the more carefully natural orders are studied, the more difficult it becomes to define them by clearly cut characters, and that it has been shown that on the same principle *Crithmum* must be placed in Araliaceae.

1. **HYDROCOTYLE** Tourn., L.; Benth & Hook. f. Gen. Pl. i. p. 872.

1. **H. sibthorpioides** Lam. Encycl. Méth. iii. p. 153 (1789); A. Rich. Mon. Hydr. in Ann. Gén. Sc. Phys. iv. p. 196, t. liv. f. 8 (1820).

H. rotundifolia Roxb. Hort. Beng. p. 21 (1814). *H. nitidula* A. Rich., *l.c.*, p. 200, t. lxiii. f. 33; Hiern in Oliv. Fl. Trop. Afr. iii. p. 5 (1877).

Huilla.—A slender herb, with the habit of a *Dichondra* Forst. In the dried-up swamps of Empalanca on the summit of the mountains of Morro de Lopollo at an elevation of 5000 to 5500 ft., in company with species of *Eriocaulon*, *Isoëtes*, *Xyris*, and with *Indigofera endecaphylla* Jacq., var. *radicans* Welw. Herb. No. 2039, *ante* i. p. 215; fr. April 1860. No. **624**.

2. **H. asiatica** L. Sp. Pl., edit. 1, p. 234 (1753); Hiern, *l.c.*, p. 6.

Icolo e Bengo.—Leaves often unequally crenate, with a very obtuse basal sinus; petioles and peduncles loosely shaggy; umbels not always 3-flowered. In moist grassy bushy places along the banks of the river Bengo from Santo Antonio to Prata, abundant; fl. and fr. Dec. 1853. No. **619**.

Libongo.—A herb, creeping far and widely; habit of a Geranium. In spongy marshes on the left bank of the river Lifune, in company with *Jussiæa erecta* L. (Welw. Herb. No. 4460) and *Azolla pinnata* Br., forma *terrestris* (Welw. Herb. No. 37), tolerably abundant; fl. and fr. Sept. 1858. No. **620**.

Golungo Alto.—In spongy swamps among tall grasses, in the vicinity of *Lissochilus giganteus* (Welw. Herb. No. 673) and *Typha angustifolia* L. (Welw. Herb. No. 247), at the base of the mountains of Serra de Alto Queta, near Sange; fl. and fr. July 1855. No. **622**.

Pungo Andongo.—At the muddy margins of the Lagõa de Quibinda, near Quibinda, at an elevation of 3500 ft., sparingly; fl. and fr. March

1857. A form remarkable for its exactly reniform leaves and very elongated petioles. No. **625**.

Mossamedes.—In wet spongy places at the margins of the Lagôa de Giraul, in company with a terrestrial form of *Pistia* and species of *Equisetum* and *Marsilea* ; fl. and fr. July 1859. No. **621**.

Huilla.—Rosette of the radical leaves on the young plant rather resembling that of *Soldanella montana* Willd. and some species of *Saxifraga* ; petiole of the stem-leaves in some cases very variable in length ; flowers whitish. In damp meadows along streams between Ferrão de Sola and Catumba, at an elevation of 5000 ft., in company with *Polygala Gomesiana* Welw. Coll. Carp. 10, and orchids, abundant ; fl. and fr. Jan. 1860. No. **623**.

2. **ERYNGIUM** Tourn., L. ; Benth. & Hook. f. Gen. Pl. i. p. 878.

1. **E. fœtidum** L. Sp. Pl., edit. 1, p. 232 (1753) ; Hiern in Oliv. Fl. Trop. Afr. iii. p. 6.

Prince's Island.—A herb, apparently perennial, or at least biennial ; root tuberous-thickened, as well as the rest of the plant aromatic almost like *Apium graveolens* L. ; leaves herbaceous ; flowers from yellowish to greenish. On moist slopes with thick herbage at the base of the Pico de Papagaio, at an elevation of about 2000 feet, abundant, fl. and fr. Sept. 1853. Used to flavour other cooked vegetables. Negro name "Jamaia" or "Lamaia." No. **2514**.

Island of St. Thomas.—In moist places along thickets in the ascent to Monte Caffé from the town, between 1000 and 2000 ft. of elevation, in the rainy season ; fl. and fr. Dec. 1860. No. **2515**.

3. **FRANCHETELLA** O. Kuntze, Rev. Gen. Pl. i. p. 267 (1891).

Heteromorpha Cham. & Schlecht (1826) ; Benth. & Hook. f. Gen. Pl. i. p. 887 ; non Cass. (1817).

1. **F. arborescens** O. Kuntze, Rev. Gen. Pl. i. p. 267 (1891).

Heteromorpha arborescens Cham. & Schlecht. in Linnæa i. p. 385, t. 5, f. 2 (1826) ; Hiern in Oliv. Fl. Trop. Afr. iii. p. 10.

Var. **platyphylla** (Welw. ms. in Herb.).

Leaflets ranging up to 6 in. long by $2\frac{1}{4}$ in. broad, elliptical.

Pungo Andongo.—A herb, 5 to 7 ft. high, with the habit almost of a *Bupleurum* ; flowers greenish-yellow. In damp thickets at the river Cuanza, near Candumba ; fl. and fr. 29 and 30 Jan. 1857. No. **2507**.

Var. **stenophylla** (Welw. ms. in Herb.)

Heteromorpha stenophylla Welw. ex Engl. Hochgebirgsfl. p. 317 (1892) ; Schinz in Bull. Herb. Boiss. ii. p. 207 (1894).

Leaflets ranging up to 2 in. long by $\frac{1}{2}$ in. broad, or rather longer, narrowly elliptical ; petals with a broad, light brown vitta carinalis.

Huilla.—In rather dry bushy places between Humpata and the river Quipumpunhime, in company with *Trichodesma Medusa* Baker and *Pimpinella huillensis* Welw., plentifully, but seen nowhere else ; fl. and fr. 23 April 1860. No **2508**. In the same locality and company, in more stony spots ; fl. and fr. April 1860. A form with even narrower leaflets acute at the apex. No. **2508*b***. A perennial herb ; stems gregarious, 3 to 4 ft. high, glaucescent, branched, leafy ; flowers yellow. In bushy pastures near Empalanca ; fr. 24 April 1860. Coll. Carp. 80.

4. **APIUM** Tourn., L.; Benth. & Hook. f. Gen. Pl. i. p. 888.

1. **A. leptophyllum** F. Muell. ex Benth. Fl. Austral. iii. 372 (1866).
Helosciadium leptophyllum DC. Mém. Soc. Phys. Genèv. iv. p. 493 (1828).

Prince's Island.—A slender, subglaucous-green, annual herb; flowers whitish; involucre and involucels wanting; carpophore cylindrical, rather thick, undivided; mericarps 5-sided. In uncultivated hollows and also in places formerly cultivated, near Bahia de Santo Antonio, not uncommon: fr. and few fl., the specimens nearly all past fl. or mutilated, Sept. 1853. No. **2498.**

Barra do Bengo.—Annual; stems slender, sometimes erect in other cases prostrate-ascending, as well as the leaves herbaceous-green; flowers whitish; involucre and involucels wanting. Along the banks of the river Bengo, in plantations of *Saccharum officinarum* L.; fl. and fr. Dec. 1853 and Jan. 1854. No. **2499***a*.

Icolo e Bengo.—A soft, subglaucescent, deep-green, annual herb; stems ascending or sometimes almost straight; flowers white, very small, fugacious; scent scarcely aromatic. By the river Bengo, not far from Panda, in plantations of *Zea Mays* L. and *Manihot utilissima* Pohl; fl. and fr. Feb. 1854. No. **2499***b*.

5. **CARUM** Riv., L.; Benth. & Hook. f. Gen. Pl. i. p. 890.

1. **C. Petroselinum** Benth. & Hook. f. Gen. Pl. i. p. 891 (1867).
Apium Petroselinum L. Sp. Pl., edit. i. p. 264 (1753).

Pungo Andongo.—Along roadsides and garden fences, apparently perennial, very common and half wild and met with nearly throughout the year, in nearly all parts of the præsidium of Pedras Negras, and growing in the streets and squares of the town; fr. mostly in May. See Welw. Apont. p. 552 under n. 109. No specimens collected. No. **2513***a*.

2. **C. imbricatum** Schinz in Bull. Herb. Boiss. ii. p. 208 (1894).

Huilla.—Habit of *C. verticillatum* Koch, but with very different foliage, which as to the indumentum is almost like that of *Lagœcia Cuminoides* L. In moist meadows and along the banks of streams, from Lopollo to the great lake of Ivantâla; fl. Jan. and fr. April 1860. No. **2513.**

6. **SIUM** Tourn., L.; Benth. & Hook. f. Gen. Pl. i. p. 893.

1. **S. Thunbergii** DC. Prodr. iv. p. 125 (1830); Hiern in Oliv. Fl. Trop. Afr. iii. p. 13.

Pungo Andongo.—A marsh herb with the habit of the genus. In rather salt, swampy places at Salinas do Dungo, near Quitage, in company with *Ruppia*; March 1857. A young plant, with foliage only and without inflorescence, perhaps referable to this species. No. **2509.**

2. **S. repandum** Welw. ms. in Herb.

A glabrous, pallid, bright green perennial herb; stem erect, widely fistular, finely pluri-sulcate, 3 to 4 ft. high, cylindrical, ½ to 1 in. in diameter at the base, branched and leafy towards the apex; leaves herbaceous-green, very pleasantly aromatic, imparipinnate; root-leaves 1 to 1½ ft. long. with a short common petiole, and 9 to 18 pairs of ovate-oblong rather obtuse crenulate

opposite sessile membranous patent leaflets ranging up to 2½ in. long by ⅘ in. broad; stem-leaves similar, with common petiole fistular rather short dilated and sheathing, and leaflets linear or nearly so, obtuse subacute or more or less apiculate, denticulate or repand, rather rigid, ranging up to 3½ in. long by ¼ in. broad, erect-patent, sessile; teeth cartilaginous on the margin, sometimes quite acute, in other cases rather obtuse, mostly adpressed and thus making the margin of the leaflet look crenulate; the cartilaginous margin turning a pretty red in the living state, but at length turning pale in the dry state, always tumid; umbels axillary and terminal, 1½ to 2 in. in diameter; peduncle ¾ to 2½ in. long, furrowed; leaves of the involucre numerous, linear, entire, ⅕ to ⅖ in. long; rays of the umbel numerous ranging up to nearly an inch; leaves of the involucels several, lanceolate, nearly equalling the short rays of the involucre; flowers from greenish to yellowish; young fruit purplish or somewhat brown.

Bumbo.—At the banks of streams in the primitive forest near Bumbo, in company with *Ranunculus pinnatus* Poir. (Welw. Herb. No. 1209) and a species of *Salix*; Oct. 1859. A young plant, with foliage only and without inflorescence, apparently this species. No. **2510.**

Huilla.—At the banks of streams and in flooded places in the valley of Lopollo, from Humpata towards Jau, abundant; fl. and young fr. Jan. 1860. No. **2511.**

Apparently nearly related to the last species, but the fruits seen are too young to enable its affinity to be definitely assigned.

7. **PIMPINELLA** Riv., L.; Benth. & Hook. f. Gen. Pl. i. p. 893.

1. **P. huillensis** Welw. ex Engl. Hochgebirgsfl. p. 319 (1892).

Huilla.—Stems quite glabrous; fruits densely muriculate. In rocky pastures among short bushes near Humpata, in company with *Franchetella arborescens* O. Kuntze, var. *stenophylla* (Welw. Herb. No. 2508); fl. and fr. 23 April 1860. No. **2502.** Slender, perennial, tuberous; radical leaves rosulate, oblong; fr. May 1860. Coll. Carp. 626.

Var. **elatior** Welw. ms. in Herb.

P. Welwitschii Engl., *l.c.*

A taller plant than the type; stem-leaves occasionally trifoliolate.

Huilla.—Flowers white. In rather open, sandy forests composed of Panda-trees, between Eme and the lake of Ivantâla; fl. Jan. and end of Feb. 1860. Nos. **2503** and **2503***b*.

2. **P. platyphylla** Welw. ms. in Herb.

An erect perennial remarkably aromatic herb; root thick, fusiform, with a very strong rank odour; stem terete, firm, subglabrous, finely sulcate-striate, pithy, usually branched in the upper part, about 3 to 5 ft. high; radical leaves reniform or orbicular-cordiform, glaucous, rigidly coriaceous, more or less rosulate, simple, dilated towards the apex, very obtuse, 2 to 5 in. in diameter or more, broadly and sharply denticulate or repand on the margin, puberulous, petiolate, quickly breaking up after the spring rains; stem-leaves oval, deeply cordate at the base, smaller;

petiole 1 to 4 in. long, dilated towards the base, amplexicaul, scarcely sheathing at the base, more or less puberulous; the uppermost leaves reduced to a dilated amplexicaul scarcely sheathing petiole of $\frac{1}{2}$ to $1\frac{1}{2}$ in. long tipped with a short laciniate limb; umbels terminating the paniculately or corymbosely divided stem, $1\frac{1}{4}$ to 2 in. in diameter; involucre and involucels wanting; rays of the umbel 12 to 20; flowers white or from whitish to greenish; ovary densely setose.

PUNGO ANDONGO,—In rocky bushy pastures at the banks of streams within the fortified lines of Pungo Andongo; fl., one specimen in December 1856, more abundant in May 1857. No. **2504**.

This plant is held in high repute by the native medical men on account of its aromatic and stimulating root; it is thus becoming rarer and rarer in the vicinity of the settlements; it is used in cases of spasmodic colic and diarrhœa. The native name is "Dongolundo."

8. **FŒNICULUM** Tourn., Mill.; Benth. & Hook. f. Gen. Pl. i. p. 902.

1. **F. vulgare** Mill. Gard. Dict., edit. 8, n. 1 (1768).

GOLUNGO ALTO and PUNGO ANDONGO.—In rocky places, wild and cultivated, thriving well, frequent; fl. and fr. April 1854 and April 1857. Nos. **2505** and **2505***b*.

See Welw. Apont., p. 552 under n. 109.

9. **PHYSOTRICHIA** Hiern in Journ. Bot. xi. p. 161, t. 132 (June 1873); Hook. Ic. Pl. xiv. p. 41, t. 1358 (Oct. 1881).

1. **P. Welwitschii** Hiern, *l.c.*

PUNGO ANDONGO.—A perennial herb, but little aromatic, with the habit of a *Tordylium*; root thick, vertical, branched at the apex below the ground; flowering stems several, scape-like, sparingly branched in the upper part, 2 to 3 ft. high; leaves coriaceous, rather hard, ternately or pinnately compound; ultimate leaflets crenate-dentate, narrowed towards the base, rather strongly nerved, not rarely folded in the living state; flowers white, the outer ones in each umbel hermaphrodite, the central ones male: bracts of the involucre and involucels numerous, sub-membranous; calyx-teeth elongate-subulate, conspicuous, acute, somewhat unequal, rather erect, persistent, indurated and scarcely or but little accrescent in fruit; petals equal, obovate or rather obcordate, inflexed at the apex, not radiant; stylopods thick, somewhat lobed; stigmas large, atropurpureous; fruit-ridges 10, densely and irregularly covered with straight cylindrical obtuse conspicuous papillæ which when old become turgid and appear bladdery: mericarps nearly flat in the face; seeds hollowed on the face. In thinly bushy sandy places not far from the left bank of the river Cuije, near Banza de Quitage towards Quibinda; fl. and sparingly in fr. March 1857. No. **2512**.

10. **PEUCEDANUM** Tourn., L.; Benth. & Hook. f. Gen. Pl. i. p. 918.

1. **P. fraxinifolium** Hiern ex Oliv. in Trans. Linn. Soc. xxix. p. 79, t. 42 (1873); Hiern in Oliv. Fl. Trop. Afr. iii. p. 22; Ficalho, Pl. Uteis, p. 192 (1884); Engl. Hochgebirgsfl. p. 322 (1892). *Steganotænia araliacea* var. *a*, A. Rich. Fl. Abyss. i.

p. 328 (1847), non *Steganotænia araliacea* Hochst. *Alvardia arborea* Fenzl in Flora 1844, p. 312, n. 494; Welw. Synopse Explic. p. 10, n. 19. *P. araliacevum* Vatke in Linnæa xl. p. 188 (April 1876); Engl., *l.c.*, p. 321 partly (1892); var. *fraxinifolium* Engl. Pflanzenw. Ost Afrik., C., p. 300 (1895); non Hiern in Oliv., *l.c.*, iii. p. 21.

Sierra Leone.—A shrub, as tall as a man; leaves clustered near the top of the branches. In wooded places between Freetown and the Sugar-loaf mountains; without either fl. or fr. middle of Sept. 1853. No. **2516**.

Golungo Alto.—A tree, 25 to 30 ft. high or sometimes even higher; trunk 1 to 1½ ft. in diameter at its base, with few or no branches in the lower part, with strict branches and curved-spreading branchlets in the upper part, both glaucous, the latter flowering; wood white, rather soft, aromatic; leaves dull-green; general involucre of the umbels many-leaved; partial involucres deeply 5-cleft, with the segments a little unequal, lanceolate-acuminate; calyx-teeth 5, ovate-triangular, acuminate; petals yellow, ovate-elliptical, not clawed, concave, terminating in a spathulate involute lobe as long as the rest of the petal; anthers yellow, the cells rather distant. In primitive forests throughout the district, mostly sporadic, either a shrub or a tree; in Sobato de Bango at Bumba; fl. June and July 1855; at Bango Aquitamba, fr. Feb. 1856; Serra de Alto Queta, Aug. 1855. Native name "Calusange." No. **2517**. A stout tree; trunk 2 to 2½ ft. in diameter at the base; bark transversely corky-rugose; wood white, resinous. Mata de Quisuculo; fr. Sept. 1855. A medicinal plant. Coll. Carp. 631.

Zenza do Golungo.—A shrub, 1½ to 3 ft. high; stem simple; leaflets deeply toothed. On slopes with scattered shrubs on the way between Tanderachique and Tandambunde, sporadic and very scarce; ripe fr. Sept. 1857. No. **2518**. An arborescent shrub, with deciduous leaves. At Tanderaxique; fr. Sept. 1854. Coll. Carp. 628.

The true Calusange, from 15 to 30 ft. high or more, with a trunk 6 to 16 in. in diameter, occurs in all the primitive forests in the interior; the leaves have a sweet and pleasant aroma, lasting a long time even in the dried leaves (see Welw. Synopse Explic. p. 10, n. 19, and Apont. p. 552 under n. 109). Welwitsch describes *P. fraxinifolium* as the queen of the Umbelliferæ in Angola, and indeed in tropical Africa, if not even in the whole world; it was becoming gradually scarce because the negroes used it everywhere as the most important remedy against chest complaints, asthma, etc., and it often occurred in a mutilated condition, as the negroes continually cut off the leaves and flowering umbels at the extremities of the branches to make plasters and concoctions; the wood is white with rather a fine grain, but soft and very readily attacked by species of *Bostrichus* and other beetles; the tree produces between the wood and bark a layer of very aromatic resin, nearly ¼ or ⅕ in. thick, not unlike gum galbanum. The majority of the specimens about Bango Aquitamba and Trombeta were from 12 to 15 ft., a few about 20 ft. high, with the trunk, a foot above the ground, of 6 to 9 in. in diameter; but, in the stony primæval forest extending almost

uninterruptedly from above Sange in Serra de Alto Queta to the bridge over the Coango stream, Welwitsch saw, among several smaller ones, a tree at least 30 ft. high with ripe fruit; with reference to this he remarked that botanically it would have been a deadly sin to have this giant Umbellifer cut down for the purpose of obtaining poles; subsequently he cut down near Bango in the forest of Quisucula a tree 18 ft. high for a couple of poles, one of which reached Europe without being destroyed by insects: on one occasion he saw his hammock negroes collect the leaves not only for medical purposes but also to put them on their shoulders under the bearing poles to prevent the chafing of the skin. If no measures are taken to prevent the devastation of the primæval forests in the highlands of Angola, and if in the future it is left to the self-interest and inconsiderate cupidity of the ignorant colonists to burn down miles of the magnificent forests, for the purpose of planting a very indifferent kind of coffee or bad cotton trees among the ashes, the possibility is that the noble Calusange will soon become very rare and may before long quite disappear from the country. It prefers a rich damp soil, and appears to thrive best and to attain its greatest height in places covered with the remains of leaves.

This is the Umbellifer referred to by Welwitsch in *Journ. Linn. Soc.* iii. p. 151 (1859), of which the leaves form one of the most famous remedies of the negroes, and of which the wood is used as timber.

Var. **hæmanthum** (Welw. ms. in Herb.).

Flowers atropurpureous, nearly blood-red.

HUILLA.—A slender shrub, about 3 ft. high, with 2 to 4 stems from the base; stems erect, simple or sparingly branched, the younger ones purplish, transversely scarred; stem-leaves very bright green, simply impari-pinnate, 4-jugate; petiole long, deep yellowish-reddish; leaflets oval or ovate-lanceolate, obtuse at the base, more or less acuminate and protracted into an elongated seta, serrate-dentate on the margin, with the teeth long- and subulate-setose, glabrous on both faces, pallid-subglaucous beneath, very shortly petiolulate; umbels terminal; flower-buds almost blood-red; flowers polygamous; peduncle with an accessory involucre below the general involucre; rays of the umbel 16 to 20; calyx-teeth distinct, narrowly deltoid, acute, persistent at least on the young fruit; petals when laid flat ovate-lanceolate with a retuse acumen, appearing obovate and emarginate on account of the inflexed acumen and impressed midrib; disk depressed, nearly flat, slightly or scarcely undulate on the margin; ovary glaucous-purplish; stylopods small or rather the styles but little thickened at the base, in the male flowers only punctiform or very short and without stigmas. By a thicket on a sandy soil, near Lopollo, only one specimen seen; fl. without fr. Feb. 1860. No. **2519**.

2. **P. muriculatum** Welw. ms. in Herb.

A rather scabrid erect perennial herb, with the habit of a parsnip, 1½ to 2 ft. high; root cylindrical, succulent, stem furrowed, somewhat branched in the upper half or two-thirds, shortly muriculate; radical and lower leaves rigidly herbaceous, pinnately trifoliolate, petiolate, 2 to 3½ in. long besides the petiole

of about the same length, 2 to 3½ in. broad; leaflets pinnately 3-5-partite; segments obovate or oblong, rounded or apiculate at the apex, usually more or less wedge-shaped at the base, more or less scabrid, muriculate-scabrid on the margin, toothed, the terminal one usually the largest; upper leaves gradually smaller with narrower segments; umbels terminating the stem and branches, 2 to 3 in. in diameter; bracts of the general involucre several, small, lanceolate or sub-linear, entire, acute, patent or reflexed; rays of the umbel 7 to 11, unequal, ranging up to 1 to 2 in. long, shortly muriculate; bracts of the partial involucres several, sub-linear, acute, entire, spreading, small, as long as some and shorter than others of the rays of the small umbellules; rays of the umbellules 7 to 15, unequal, short in flower, ranging up to ⅗ in. long in fruit: flowers yellowish or greenish-white; fruit ⅖ to ½ in. long, obovate-oblong, dorsally compressed, ⅛ to ¼ in. broad, glabrous; mericarps winged.

HUILLA.—In somewhat rocky bushy pastures between Mumpulla and Nene, not common; fl. and ripe fr. end of May and beginning of June 1860. No. **2520**. In sandy bushy places among short grass, about Lopollo and towards the lake of Ivantâla; also road near Ohai; fl. and young fr. April, May, and end of Feb. 1860. A form with more obtuse teeth to the lobes of the leaves. No. **2521**.

11. **LEFEBVREA** A. Rich. in Ann. Sc. Nat., Ser. 2, xiv. pp. 260, 384, t. 15 f. 1 (1840); Benth. & Hook. f. Gen. Pl. i. p. 921 (*Lefeburia*).

1. **L. benguelensis** Welw. ex Engl. Hochgebirgsfl. p. 322 (1892) (*Lefeburia*). In the absence of ripe fruit the determination of the genus is somewhat doubtful.

HUILLA.—A herb, 5 to 8 ft. high, annual biennial or triennial, with a habit suggestive of *Levisticum officinale* Koch; stem straight, ranging up to 1½ in. in diameter at the base, quite glabrous, glossy, bright blood-red below, decked with blood-red lines or spots above; with elongated branches from the base, tumid at the nodes; lower branches 4 to 5 ft. long, spreading or erect-patent, the upper ones gradually shorter, all in the axils of variously dissected or pinnate widely and long-sheathing leaves; radical leaves as well as the upper leaves very variable as to the shape of their leaflets; general involucre wanting; bracts of the partial involucels 6 to 8; flowers polygamous; the central umbels hermaphrodite, the lateral ones mostly male, apparently without styles or with rudimentary ones; flowers from greenish to yellowish; calyx-limb inconspicuously toothed; petals ovate-lanceolate, involute at the apex; stamens longer than the petals, with red anthers; stylopods large, turgid in fruit, deflexed on both sides; fruit dorsally compressed, obovate, subtruncate at the apex, winged at the margin; mericarps marked somewhat inconspicuously with 3 obtuse ridges almost obsolete towards the base of the fruit, the two lateral ones passing into the wings of the fruit. In the drier hilly places near Lopollo and among plantations of *Sorghum*, abundant; fl. and young fr. March 1860. Fruiting specimens lost in the war with the Monanos. No. **2524**. Among plantations of *Penicillaria* near Lopollo; in young fl. Feb. 1860. No. **2524***a*. In neglected fields formerly planted with *Penicillaria* at Monino; fl. April 1860. A form with acutely lobed leaf-segments. No. **2525**.

2. **L. angolensis** Welw. ex Ficalho in Bol. Soc. Geogr. Lisb., Ser. 2, p. 712 (6 April 1882) (*Lefeburia*); Ficalho, Pl. Uteis, p. 192 (1884).

Alvardia (sp.), Welw. Apont. p. 590, n. 92. *Lefeburia Welwitschii* Engl. Hochgebirgsfl. p. 322 (1892).

GOLUNGO ALTO.—A herb, 3 to 5, rarely 6, ft. high, varying from annual to triennial, with the aroma of turpentine; stem erect, cylindrical, rather obtusely angular, filled with a white pith, spotted with purple below, especially at the origin of the branches, branched from the base; lower branches erect-patent, very long (4 to 5 ft.), slender, distant, the upper ones approximated; leaves broad, semi-amplexicaul, very variable in shape, sometimes pellucid-punctate; bracts of the involucels several, lanceolate, much acuminate, membranous on the margin; flowers from greenish to yellowish, polygamous; calyx-teeth scarcely conspicuous; petals ovate-orbicular, broadly subcordate at the base, sessile, apical acumen obtuse, inflexed or subemarginate; stylopod depresso-conical, with several small lobes on the deflexed margin, inserted in the deep sinus between the prolonged wings of the fruit; styles short, incurved, elongating, deflexed in fruit; primary ridges on the carpels 3; vittæ broad; a secondary ridge on each side of the primary ones undulated, vittate within. In the damp shady primitive forests of Mata de Quisucula, especially along streams, near Bango Aquitamba; fl. and young fr. May; fr. June 1856. Negro name "Calusange caféle" (small calusange). In Mata de Alto Queta, young fl. beginning of April 1856. No. **2522**. An annual or biennial herb, 2 to 4 ft. or more, with the habit and mode of growth of *Carum Petroselinum*, very resinous; flowers turning yellowish, small, rather fleshy, not dioecious; calyx-limb tumid on the margin, without teeth; petals ovate, concave, greenish, scarcely patent even during flowering, mostly scarious at the apex. Young root tuberous. In shady places in the primitive forests of Alto Queta and in deep hollows at Quibanga; fl. and fr. April and May 1856. No. **2522*b***. An annual herb; root long, fusiform: stem 3 to 4 ft. high, erect, purplish; leaves herbaceous-green; flowers apparently yellowish. In the primitive forest of Quisucula, rather rare; fr. 8 Sept. 1855. COLL. CARP. 627. Herbaceous. In primitive forests by streams; fr. July 1857. COLL. CARP. 629. A herb, 3 to 5 ft. high, branched above; leaves compound; flowers yellowish. In the moist primitive forest of Quisucula near streams, at Cungulungulo; fr. July 1858. Negro name "Calusange oféle." COLL. CARP. 630.

PUNGO ANDONGO.—A herb, 3 ft. high, apparently biennial or perhaps perennial, with yellowish flowers. In rocky thickets at the banks of streams near Catete; fl. and young fr. Feb. 1857. No. **2523**. An erect, annual biennial or perennial herb, 2 to 4 ft. high, with the habit of parsley; stems purplish; leaves decompound, ternato-partite; ultimate segments of the radical leaves broad and oval, of the stem-leaves narrower obcuneate, all acutely dentate; flowers yellowish or greenish-yellowish; petals greenish-yellow, bordered with purple, not appendaged, shorter than the stamens. In damp secondary thickets near the stream Tangue within the fortified lines of Pungo Andongo; fl. middle and end of (22, 29 and 30) Jan. 1857. No. **2523*b***.

COLL. CARP. 94 consists of ripe fruits of a much branched annual umbellifer, 4 to 6 ft. high with compound leaves; they were grown in Senhor Kneissman's garden in Huilla in May 1860, and appear to belong to this genus and either to this or the previous species.

12. **CORIANDRUM** Tourn., L.; Benth. & Hook. f. Gen. Pl. i. p. 926.

1. **C. sativum** L. Sp. Pl., edit. 1, p. 256 (1753); Hiern in Oliv. Fl. Trop. Afr. iii. p. 3.

Golungo Alto.—Along the streams Delamboa, Quibolo, etc.; frequently cultivated and often wild; fl. and fr. August 1856. No. **2506**. See Welw. Apont. p. 552 under n. 109.

13. **CAUCALIS** Tourn., L.; Benth. & Hook. f. Gen. Pl. i. p. 928.

1. **C. mossamedensis** Welw. ms. in Herb.

An annual herb, 6 to 18 inches high, dichotomously branched from the base, aromatic; branches divaricate or spreading, glabrate or nearly so, furrowed, leafy; leaves pinnatisect, herbaceous-green, ranging up to 3 inches long; ultimate segments linear, glabrous or nearly so or slightly lepidote; petiole dilated, short, clasping towards the base, often ciliolate; umbels leaf-opposed and terminal, 1 to 2 inches in diameter; peduncles ranging up to 4 inches long, striate; bracts of the involucre and of the involucels narrowly linear, several, hairy, ranging up to $\frac{1}{4}$ inch long, acute; rays of the umbel 6 to 10; umbellules densely flowered; flowers white, on short pedicels; calyx-limb obsolete or concealed by the whitish hairs of the densely setose ovary; petals incurved at the apex; stamens exserted; anthers violet-coloured; fruit ovoid, laterally compressed, constricted at the commissure; carpels almost terete; ridges all obscure or not prominent, densely setose with irregularly arranged whitish prickles; vittæ all solitary; stylopod conical, more or less free from the prominent axis of the carpophore; styles divaricate or nearly deflexed; carpophore bipartite; seeds dorsally somewhat compressed, broadly furrowed or almost hollowed on the face.

Mossamedes.—In the sparingly herbaceous maritime depressions among gravelly hills above Praia da Amelia, towards the mouth of the river Caroca, near Cabo Negro, nearly always in company with *Merremia multisecta* Hallier (Welw. Herb. No. 6112) and *Gisekia*, abundant, but seen only in one place; fl. and fr. 4 Sept. 1859. No. **2500**. In moist sandy places at the banks of the river Bero, rather rare; fl. and fr. July 1859. No. **2501**.

This belongs to the section Torilis, and is probably the plant referred to by Welwitsch in Journ. Linn. Soc. v. p. 185 (1861) as a *Pimpinella*-like annual Umbellifer.

LXVIII. ARALIACEÆ.

1. **CUSSONIA** Thunb.; Benth. & Hook. f. Gen. Pl. i. p. 944.

1. **C. angolensis** Hiern in Oliv. Fl. Trop. Afr. iii. p. 32.

Sphærodendron angolense Seem. in Journ. Bot. iii. p. 34, t. 26 (1865), and Rev. Heder. p. 37, t. 1 (1868).

Ambaca.—A tree, 15 to 25 feet high; trunk 1 to $1\frac{1}{2}$ feet in diameter, very strictly erect, in the adult state bare to a great extent, bearing at the apex an exactly spherical head of branches and foliage and presenting a remarkable appearance, especially when the trees are massed and grouped into woods; flowers greenish. In the denser but

lower woods from Isanga to Ngomba, occasionally forming forests, abundant; fr. Oct. 1856. No. **480**.

Pungo Andongo.—A tree, 15 to 30 feet high, the older ones with a trunk 2 feet in diameter or more at the base; trunk conical, very erect, bare for two-thirds its height, then densely crowned with a spherical head; bark spongy; wood white, tough, durable, used for many purposes, chiefly for house building; leaves 8-foliolate; leaflets thinly coriaceous, rather fleshy and glossy; flowers greenish, hermaphrodite, arranged in straight racemes which are 1½ feet long at the extremities of the branches spongy-clavate and congested; calyx-tube adnate to the ovary, with a very short obsoletely 5-dentate limb not exceeding the depresso-conical disk; petals 5, inserted at the margin of the disk, very patent at the time of flowering; stamens 5, inserted with the petals and alternating with them; anthers incumbent; ovary inferior, crowned with the epigynous disk, 2-celled; cells uni-ovulate; ovules anatropous; styles 2, short, thick, straight, more or less connate, truncate, stigmatose at the apex; fruit not juicy. In forests about the præsidium along the banks of the river Cuanza, and of the stream Luxillo, in rather dry situations, abundant; fl. beginning of Dec. 1856, fr. March 1857. Native name "Mussása" or "Musassa" or "Mussaça." No. **479**.

Huilla.—A tree, 20 feet high and more, sufficiently singular; trunk elongated-conical, always very strictly vertical, fasciculately branched at the apex; head of foliage precisely globular. In the drier forests, especially on a sandy soil, between Lopollo and the great lake of Ivantâla, at an elevation of 5,000 feet, non uncommon; without either fl. or fr. Feb. 1860. Frequently used at Lopollo for making boundary fences, by driving in stakes to take root after the fashion of willow-pitchers. Native name "Mupongo." No. **481**.

See Welw. Apont. p. 553, n. 110.

According to Welwitsch the name of this genus was originally given and communicated by him to Seemann before its publication by the latter. It is the plant referred to by Welwitsch in Journ. Linn. Soc. iii. p. 153 (1859), as a new genus of Araliaceæ.

LXIX.—RUBIACEÆ.

In Angola proper, Rubiaceæ are not so abundant in the littoral region as in the mountainous and highland regions, where they constitute a considerable proportion of the total vegetation in the primæval forests; the coast species are almost exclusively trees or shrubs; those of the mountainous region are for the most part woody climbers or trees of noble habit, furnishing excellent timber for building, as for example "Mangue do monte" (*Corynanthe paniculata*), and "Mungo" (*Mamboga stipulosa*); and in the highland region herbaceous species are mostly met with, not less conspicuous, however, by reason of the elegance of their habit and the brilliancy of their flowers.

In this family, and particularly in the Cinchoneæ and neighbouring tribes, the calyx and corolla are both pentamerous and hexamerous in one and the same individual plant, and in the same species some specimens are seen throughout with pentamerous and others with hexamerous flowers, without any accompanying

difference in the character of the foliage, etc.; this condition occurs very commonly in the genus *Fadogia*. It is extraordinary that the number of stamens and divisions of the parts of the flowers is sometimes 4, sometimes 5 or 6; and this state of things is conspicuous also in Loganiaceæ even to a greater extent, while the contiguous families of Apocynaceæ and Asclepiadaceæ are strictly pentamerous throughout, and Gentianaceæ but seldom have flowers varying from the tetramerous to the pentamerous condition.

The arborescent and shrubby members of the family, that is, nearly all with the exception of the tribes Oldenlandieæ and Spermacoceæ, greatly diminish in number of species in western tropical Africa from the 12th or 13th degree of south latitude southwards; they occur more abundantly nearer the equator; but on the eastern side of the continent numerous species of *Tricalysia*, *Gardenia*, and several small genera such as *Alberta* extend to Natal and the Cape. Tropical Africa abounds with Gardenieæ, which are adorned with magnificent flowers, and often with splendid foliage which, in freshness, gloss, and elegant arrangement, surpasses that of most of the remaining Rubiaceæ.

Welwitsch advised the introduction and cultivation of *Cinchona* into the island of St. Thomas and of Ipecacuanha into Golungo Alto. See Welwitsch, Apont. p. 549, n. 87, and p. 579, note 12; Synopse Explic. p. 10, n. 20.

Aromatic flowers occur frequently, especially in the white-flowering trees and shrubs. The largest spines occur in *Cuviera angolensis* Welw. Useful wood is supplied by several species of Gardenieæ, equal to box-wood or still better; *Adina microcephala* also affords excellent wood for cabinet-makers' work, and *Coffea* for furniture.

In his diary, 14 Feb., 1857, Welwitsch notes as collected in Pungo Andongo, during an excursion to Quilanga, an annual creeping and ascending Rubiacea, with the habit of *Saxifraga* § *Robertsonia*; I have not identified any such specimen.

1. **ADINA** Salisb.; Benth & Hook. f. Gen. Pl. ii. p. 30 (April 1873).

1. **A. microcephala** Hiern in Oliv. Fl. Trop. Afr. iii. p. 40; Haviland in Journ. Linn. Soc. xxxiii. p. 42 (1897).

Nauclea microcephala Delile in Caill. Pl. Afr. p. 67 (1826), non Wall. *A. lasiantha* K. Schum. in Engl. Pflanzenw. Ost-Afrik., C., p. 378 (1895). *Adina* (sp. n.), Ficalho, Pl. Uteis, p. 193 (1884).

Bumbo.—A handsome lofty evergreen tree, renowned for its excellent hard wood; trunk 3 to 8 or even more than 12 ft. (?) in diameter. In primitive forests by streams near Bumbo; fl. and fr. 17 and 18 Oct. 1859. Colonial name "Páo d'oleo," or "Pau de oleo." No **3029**.

Var. **Galpini**.

A. Galpini Oliv. in Hook. Ic. Pl. t. 2386 (1895). *A. microcephala*, var. *β*, Haviland, *l.c.*, p. 43. Leaves verticillate, ternate,

narrowly lanceolate-elliptical, narrowed at both ends, 3 to 9 in. long by $\frac{1}{3}$ to $1\frac{1}{2}$ in. broad, resembling those of a willow.

MOSSAMEDES.—A vast tree, 50 ft. high or more, with the habit of *Nerium Oleander* L.; wood hard, oily, very excellent; branches erect-spreading; leaves coriaceous, not milky. Called by the colonists "Páo d'Oleo." On rocks at Bocca do Rio Bero; without either fl. or fr., beginning of July 1859. No. **3028**.

According to a note of Welwitsch this species is known by the native name of "Mohambo."

2. **MAMBOGA** Blanco, Fl. Filipinas, edit. 1, p. 140 (1837).

Mitragyna Korthals, Obs. Naucl. Ind. p. 19 (1839), non *Mitragyne* Br. (1810) = *Mitrasacme* Labill. (1804). *Stephegyne* Korth. (1840 ?); Benth. & Hook. f. Gen. Pl. ii. p. 31.

1. **M. stipulosa.**

Nauclea stipulosa DC. Prodr. iv. p. 346 (1830). *N. bracteosa* Welw. Synopse Explic. p. 48. n. 130 (1862). *Mitragyne macrophylla* Hiern in Oliv. Fl. Trop. Afr. iii. p. 41; Ficalho, Pl. Uteis, p. 193 (1884). *M. stipulosa* O. Kuntze, Rev. Gen. Pl. i. p. 289 (1891). *Mitragyna macrophylla* Haviland in Journ. Linn. Soc., xxxiii. p. 72 (1897).

GOLUNGO ALTO.—An extensive tree, 40 to 50 ft. high; wood good; branches patent; leaves very large, ovate or obovate, coriaceous, glossy; stipules the largest seen by Welwitsch amongst Angolan Rubiaceæ; bracts spathulate, pilose; calyx shortly tubular, scarious, truncate, with an entire margin; capsule 10-ribbed, more or less pentagonal, scarcely bursting at the base. At the banks of the river Casaballa in Sobato de Bumba; fl.-bud and young fr. 22 Oct. 1855. Native name "Mungo." No. **3027**. Bumba; heads of fl.-buds 22 Oct. 1855. "Mungo," COLL. CARP. 632.

Aëranthus Gruyonianus Reichenb. f. (Welw. Herb. No. 653), grew as an epiphyte on the branches of this tree. This, one of the trees called "Mungo," is much prized by the inhabitants of Golungo Alto on account of the excellence of its wood, which is used for house-building and furniture (see Welw., *l.c.*). The smaller leaves bear a tolerably close resemblance to the foliage of *Morelia senegalensis* A. Rich., a plant of tropical Africa north of the Equator.

3. **OUROUPARIA** Aubl. Pl. Guian. i. p. 177. t. 68 (1775).

Uncaria Schreb. Gen. i. p. 125 (1789); Benth. & Hook. f. Gen. Pl. ii. p. 31.

1. **O. africana** Baill. in Bull. Soc. Linn. Par. i. p. 228 (1879).

Uncaria africana G. Don, Gen. Syst. iii. p. 471 (1834); Hiern in Oliv. Fl. Trop. Afr. iii. p. 41. *Uruparia africana* O. Kuntze, Rev. Gen. Pl. i. p. 301 (1891).

Var. **angolensis.**

Uncaria africana var. *angolensis* Haviland in Journ. Linn. Soc. xxxiii. p. 76 (1897).

An arborescent shrub, glabrous except the inflorescence; trunk in some cases more than 100 ft. long and 6 in. in the lower part, climbing to a very great height and then hanging down;

branches patent, fuscous, rather glossy, tetragonal, leaves opposite, elliptical, narrowly acuminate at the apex, obtusely narrowed or nearly rounded at the base, thinly coriaceous, glossy, dark-green above, paler beneath, 2 to 4½ in. long, ½ to 1⅔ in. broad; lateral veins about 6 on each side of the midrib, slender; petiole ⅛ to ¼ in. long; stipules ovate, small, somewhat hairy on the inner face, early deciduous; spines axillary, mostly crooked, ¼ to ¾ in. long; flower-heads terminating the branches, shortly pedunculate, globose, about 2 in. in diameter; flowers golden-tawny, about ¾ to ⅞ in. long (including the exserted style), very numerous, crowded; pedicels about ⅛ to ⅙ in. long in flower, ⅗ in. long in fruit, tomentellous; bracts 0; calyx silky-tomentellous with short upward hairs, somewhat constricted above the ovary, greenish-fuscous; tube broader than the ovary, campanulate, funnel-shaped, ⅙ to ⅕ in. long, shortly 5-cleft, lobes thickly lanceolate; corolla ½ to ⅗ in. long; tube slender, except the base clothed outside with downward tawny short silky-tomentose hairs, ⅓ in. long; limb much broader than the tube, hemispherical, ⅕ to ¼ in. in diameter, golden-tawny tomentose outside, glabrous inside, deeply 5-lobed; segments about ⅛ in. long, obovate-oblong, rounded at the apex with an apiculus; stamens 5, about half as long as the corolla-lobes, glabrous, introrse, inserted on short flattened filaments at the base of the corolla-limb; ovary ellipsoidal, tomentose, rather thicker than the base of the calyx-limb, much thinner than the top of the calyx-limb; style filiform, exserted about ¼ in. beyond the corolla, glabrous below, stigmatose and rather thickened in the upper part towards the clavate stigma; young fruit subglabrous, about ⅜ in. long, ⅙ in. thick, narrowed at both ends especially towards the base.

Golungo Alto.—In the primitive forests of Sobato de Mussengue, rather rare; fl. middle Feb.; young fr. March 1856. No. **3030**. In the very dense primitive forest of Quibanga, sporadic; fl.-bud, Jan. 1856. No. **3031**.

4. **HYMENODICTYON** Wall.; Benth. & Hook. f. Gen. Pl. ii. p. 35.

1. **H. Kurria** Hochst. in Flora xxvi. p. 71 (1843); Hiern in Oliv. Fl. Trop. Afr. iii. p. 42.

Pungo Andongo.—A small tree of 8 to 10 ft.; trunk straight, 4 to 5 in. in diameter near the base; head dense, hemispherical; leaves thickly coriaceous, rather rigid, almost membranous in the dried state, subglaucous-green, the new ones very large; marginal glands of the stipules clavate, thick, turning red; bracts below the racemes 2 together, lanceolate, almost like those in *Tilia*, dry, on long stalks. In rocky shady parts of the præsidium, Barranco da Pedra Songue at the banks of the Ca-Salalé not common; fl. Nov. 1856; fr. March and May 1857. No. **3032**.

Var. **tomentellum** (Welw. ms. in Herb.).

A small tree, 10 to 15 ft. high; head ovoid-globose, lax; branches erect-spreading, somewhat twisted; leaves canescent-tomentose beneath, crowded towards the extremities of the branchlets; flowers from whitish to yellowish, slightly fragrant.

HUILLA.—In the more elevated wooded rocky but little shady parts of Morro de Lopollo, sporadic; fl. Dec. 1859; fr. March 1860. No. **3033**.

5. **CORYNANTHE** Welw.; Benth. & Hook. f. Gen. Pl. ii. p. 36.

1. **C. paniculata** Welw. in Trans. Linn. Soc. xxvii. p. 37, t. 14 (1869); Hiern in Oliv. Fl. Trop. Afr. iii. p. 43; Ficalho, Pl. Uteis, p. 194.

Rubiacea, Welw. Synopse Expl. p. 7, n. 2 (1862).

GOLUNGO ALTO.—A very useful and magnificent tree, 40 to 60 ft. high, with the habit of *Phillyrea latifolia* L.; trunk straight, very rarely bent, 1 to 2½ ft. in diameter near the base; wood very dense, excellent, of fine grain, white, hard, durable, used in house building and for many other purposes; branches rather erect, the lower ones usually directed downwards on the adult tree, leaves opposite, coriaceous, but little glossy (or in the dried state glossy-green above), evergreen; flowers thyrsoid, collected in terminal panicles, white, slightly fragrant, much frequented by bees, rather fleshy; calyx oblong-campanulate, green, 5-toothed, inferior, persistent, including the ovary; corolla white, hypocrateriform, shaggy at the throat, spreading in flower, with a fleshy subturbinate tube inserted on the throat of the calyx, with a 5-cleft limb and gibbous ovate lobes valvate in æstivation, and having a long club-like whitish appendage below their hooded tops; stamens 5, alternating with the corolla-lobes, exserted; filaments sub-obsolete; anthers rigid, fleshy, linear-oblong, subsessile at the throat of the corolla, 2-celled, dehiscing longitudinally, attached at the middle of the back; cells a little diverging below, subulate and empty at the apex; ovary ovoid-conical; style thickly filiform, central, filling the whole cavity of the corolla-tube, exserted at the time of flowering, white; stigma ovoid, obtuse, thick, rather compressed, longitudinally furrowed, white; capsule fuscous, bi-sulcate, mucronate with the persistent calyx-teeth. Forming extensive forests in nearly all the more elevated parts of Quilombo and Mata de Alto Queta; fl. Jan. to May, fr. March to July, 1855 and 1856; about Montalegre (Cungulungulo), Feb. 1855. Native name "Mangue," the Portuguese name is "Mangue do Monte" or "Paco de Golungo Alto." No. **1508**.

It occurs also in similar situations in the districts of CAZENGO and DEMBOS. On the bark of this tree grew the Lichens nn. 130, 139, and on its wood the Fungus n. 366.

6. **CROSSOPTERYX** Fenzl; Benth. & Hook. f. Gen. Pl. ii. p. 41.

1. **C. Kotschyana** Fenzl, Nov. Stirp. Dec. (vi.) p. 46 (1839): Hiern in Oliv. Fl. Trop. Afr. iii. p. 44; Ficalho, Pl. Uteis, p. 194 (1884).

C. africana Baill. Hist. Pl. vii. p. 489 (1879). Rubiacea, Welw. Apont. p. 590 [n. 96].

GOLUNGO ALTO.—A loosely branched tree, 12 to 15 ft. high; trunk 4 to 6 in. in diameter near the base; branches elongated, erect-spreading; branchlets dilatate-flattened at the nodes from which the inflorescence arises; leaves bright-green, sub-tomentose beneath, deciduous; capsule 2-valved, dehiscing at the apex, 2-celled; cells many-seeded; seeds surrounded with a fringed wing. In rough places at the borders of the primitive forests of Alto Queta; scarcely ripe fr. June 1856. No. **3034**. A shrub of 12 ft., with spreading branches, and leaves deciduous at the time of fruiting. Structure of the fruit very curious. At Catomba; fr. July 1856. COLL. CARP. 633.

ZENZA DO GOLUNGO.—A small tree, 8 to 15 ft. high, with spreading or suberect branches and opposite coriaceous dull-green deciduous leaves ; capsule chartaceous-woody, crustaceous, crowned at the apex with the remains of the calyx-limb, 2-valved, 2-celled ; cells 5- to 8-seeded ; seeds obovate-ellipsoidal, compressed, surrounded with a broad radiating membranous fringed wing ; albumen surrounding the small straight embryo; cotyledons flat. In hilly wooded rather dry places on the left bank of the rivulet Chixe (or Xixe), among the mountains of Mongolo ; ripe fr. without fl. and almost leafless, Sept. 1857. Native name "Musésse." The negroes make spoons, etc., from the hard, white-yellow wood of this tree. No. **3035** and COLL. CARP. 166.

7. **NEUROCARPÆA** Br. in Salt, Abyss., App. (iv.) p. lxiv. (1814).

Pentas Benth. in Bot. Mag. t. 4086 (1844) ; Benth. & Hook. f. Gen. Pl. ii. p. 54.

1. **N. lanceolata** Br. Britten, Journ. Bot. 1897, p. 129.

P. carnea Benth. in Bot. Mag. t. 4086 (1844) ; Hiern in Oliv. Fl. Trop. Afr. iii. p. 46 ; var. *Welwitschii* Scott Elliot in Journ. Linn. Soc. xxxii. p. 434 (1896).

HUILLA.—In wooded meadows by the river Monino ; fl. and fr. Dec. 1859. No. **5308**.

2. **N. purpurea.**

Pentas purpurea Oliv. in Trans. Linn. Soc. xxix. p. 83 (1873) ; Hiern, *l.c.* ; Var. c., Scott Elliot, *l.c.*, p. 436.

HUILLA.—Flowers bluish-purple. In wooded meadows about the lake Ivantâla ; fl. and fr. Feb. 1860. No. **5315**.

3. **N. arvensis.**

Pentas arvensis Hiern, *l.c.*, p. 47 ; Scott Elliot, *l.c.*

Var. **violacea.** *P. arvensis* var. *violacea* Hiern ex Scott Elliot, *l.c.*

A robust erect branched perennial herb, 2½ to 4 ft. high, hoary-green, with soft pallid short hairs on the stem branches foliage and inflorescence ; leaves opposite or verticillate three together, sessile or subsessile, narrowly ovate or elliptical or the upper ones lanceolate, narrowed more or less at both ends, often rather acutely so, especially towards the apex, occasionally cleft at the apex, firmly membranous, 3 to 5½ in. long by 1 to 2¼ in. broad, the upper ones smaller, lateral veins about 12 on each side of the midrib ; stipules usually 3 to 5 together, narrow, unequal, ⅛ to ⅜ in. long, united at the base ; cymes terminal and sub-terminal, much branched, 1 to 4 in. in diameter ; ultimate pedicels mostly very short or obsolete ; bracteoles filiform or subulate ; flowers numerous, ⅓ in. long ; calyx ⅛ in. long, hairy outside, smooth inside, with 5 rather unequal short narrowly ovate or lanceolate rather acute lobes ; corolla ¼ in. long, rather densely hairy outside, of a pale-violet colour, shortly 5 (—4)-lobed, throat closed with very dense and rigid violet-coloured hairs ; anthers and style glabrous and included ; fruit obovoid, ⅕ in. long, tipped by the persistent calyx-lobes ; carpels loculicidal ; seeds several.

PUNGO ANDONGO.—In the more elevated rocky thickets among the gigantic rocks of the fortress ; fl. Jan. 1857 ; fr. Nov. 1856. No. **5309**.

On elevated grassy slopes within the præsidium ; fl. and fr. Feb. and April 1857. No. **5310**. In woody rocky places near Muta-Lucala ; one specimen, ripe fr. March 1857. No. **5311**.

4. **N. herbacea** Hiern, sp. n.

Pentas, sp. nov., Hiern ex Scott Elliot, *l.c.*, p. 437.

A slender erect herb, 2 to 2½ ft. high, apparently annual, nearly simple or more or less branched ; stem and branches puberulous above with short pallid hairs, glabrate below ; branchlets compressed ; leaves opposite, elliptical or somewhat lanceolate, narrowed more or less at both ends, acutely so towards the base, thinly membranous, puberulous with short pallid hairs especially along the veins beneath, 2 to 3½ in. long by ½ to 1½ in. broad ; lateral veins 8 to 10 on each side of the midrib, slender ; petiole ranging up to an inch in length, more or less densely puberulous ; stipules lanceolate or narrower, often with supplementary lateral filiform segments, hairy, about ¼ in. long ; cymes terminal or subterminal, small, crowded, more or less pedunculate, ½ to ¾ in. in diameter, elongating in fruit into an inflorescence ranging up to 4 in. long ; flowers subsessile, scarcely ¼ in. long, white ; calyx puberulous, unequally 5-lobed, nearly or just equalling the corolla ; corolla shortly salver-shaped, 5-lobed, slightly puberulous outside ; limb $\frac{1}{16}$ to $\frac{1}{12}$ in. in diameter ; throat bearded ; anthers 5, included, inserted in the throat of the corolla on very short filaments, glabrous ; style just included, bifid at the stigmatose apex ; ovary 2-celled ; ovules numerous ; fruit funnel-shaped below, ⅛ in. long exclusive of the persistent calyx-limb, 2-celled ; seeds numerous.

Golungo Alto.—In palm-groves near the river Cuango, at Cacarambola, sparingly ; fl. and fr. Feb. and June 1855. No. **5304**.

8. **PENTACARPÆA** Hiern, gen. nov.

Calyx-tube cup-shaped, adhering to the ovary, broad near the base, truncate at the apex, which is furnished with one foliaceous lanceolate lobe longer than the tube and 2 to 4 narrow short lobes, all the lobes more or less persistent. Corolla salver-shaped and somewhat funnel-shaped, hairy outside, tube elongated narrow, throat slightly dilated, bearded within ; limb spreading, somewhat unequal, with 5 obtuse lobes shorter than the tube, valvate in æstivation. Stamens 5, inserted about the base of the corolla-tube ; anthers linear-oblong entire attached at the back near the base to very short filaments. Disk fleshy, small. Style filiform, divided at the apex into 5 short lobes which are stigmatose on all sides. Ovary wholly inferior, 5-celled ; ovules numerous. Fruit ovoid, dry, for some time tipped by the persistent calyx-limb, 5-celled ; cells many-seeded.

This genus differs from *Neurocarpæa* by the 5 cells in the ovary and fruit.

1. **P. arenaria.**

A perennial herb ; rootstock woody ; stems numerous, ascending, 1 to 1½ ft. long, simple or branched, reddish-brown, clothed with whitish short soft mixed hairs ; leaves lanceolate ovate or

oval, pointed or obtuse at the apex, usually rounded at the sessile or subsessile base, yellowish-green, minutely scaly on both faces, thinly scattered with short whitish hairs especially along the veins on the lower face, 1 to 2½ in. long by ⅓ to 1 in. broad; lateral veins 5 to 7 on each side of the midrib; stipules narrowly lanceolate, often with supplementary lateral filiform segments; inflorescence terminal, pedunculate, in compact branched small cymes, about 1 in. in diameter, the main branches somewhat lengthening in a spicate manner 1 to 2 in. long in fruit; flowers red, sessile or subsessile, ⅔ in. long; calyx somewhat hairy or ciliate; tube $\frac{1}{20}$ in. long, the foliaceous lobe ⅛ in. long or on the fruit ¼ in. long; corolla-tube somewhat hairy outside; limb ¼ in. in diameter; lobes somewhat unequal, oval-ovate; anthers glabrous, included; style shortly exserted, glabrous; fruit ⅙ to ⅕ in. long exclusive of the persistent foliaceous calyx-lobe at the apex.

Pungo Andongo.—In sandy situations at the skirts of the forest, near Lombe and Candumba; fl. and fr. March 1857. No. **5312**.

9. **OTOMERIA** Benth.; Benth. & Hook. f. Gen. Pl. ii. p. 55.

1. **O. dilatata** Hiern in Oliv. Fl. Trop. Afr. iii. p. 50.

O. speciosa Scott Elliot in Journ. Linn. Soc. xxxii. p. 437 (1896), quoad specimina Welwitschiana citata nn. 5316, 5317.

Huilla.—Flowers purple-red, somewhat like a *Lychnis*. At the cataract of Ferrão da Sola; fl. and fr. April 1860. No. **5316**. An undershrub or almost a herb, 2 to 2½ ft. high or rarely taller, with the habit of a *Lychnis*; stems purple; flowers brilliantly bloodred-scarlet: calyx-segments unequal, narrow with some broader but none ever elliptical or dilated-cordiform as in true *Mussænda*. At the cataracts between Humpata and Lopollo, in elevated stations, about 5000 ft. high, rather rare; fl. and fr. 2 Jan. 1860. No. **5317**.

10. **OLDENLANDIA** Plum., L.; Benth. & Hook. f. Gen. Pl. ii. p. 58.

Hedyotis L.; Benth. & Hook. f., *l.c.*, p. 56. *Pentodon* Hochst.; Benth. & Hook. f., *l.c.*, p. 58.

1. **O. Bojeri** Hiern in Oliv. Fl. Trop. Afr. iii. p. 53.

Pungo Andongo.—A perennial herb; rootstock woody; stems numerous, erect or ascending; flowers whitish-purplish, scarcely or but little projecting beyond the bracts of the capitate cymes. In wooded thickets and in exposed sandy places near Cazella and Luxillo; fl. and fr. Jan. 1857. No. **3080**. This is difficult to discriminate from the next species; possibly both species occur mixed under this No.

2. **O. globosa** Hiern, *l.c.*, p. 54.

Golungo Alto.—A perennial herb, 1 to 2 ft. high, strictly erect, pallid-green; rootstock woody; stems numerous; flowers whitish. On very elevated declivities among the mountains of Quilombo-Quiacatubia, rather rare; fl. Feb. 1855. No. **3221**. A herb, 1 to 1½ ft. high, roughly pilose, perennial, erect, rigid, with the habit of Melastomaceæ. On the sparingly grassy slopes of the more elevated ridges of the mountains of Queta, above N-dele; young fr. end of March 1856. No. **3222**.

Huilla.—Flowers small, white. In hilly exposed places; fl. and fr. Dec. 1859. No. **3081**. Flowers from whitish to pale purplish. In

herbaceous exposed elevated situations at Empalanca; fl. and fr. April 1860. No. **3082**.

3. **O. sipaneoides** K. Schum. in Engl. Bot. Jahrb. xxiii. p. 417.

Pungo Andongo.—An erect or ascending tender herb; leaves deep-green, membranous; flowers beautifully azure-blue. In the caves of the elevated rocks of Tunda Quilombo within the præsidium, fl. and fr. Jan. 1857. (Capsule dehiscing loculicidally at the apex; seeds numerous, angular.) No. **3075**.

Var. **asperuloides** Hiern.

A weak, slender, erect, herbaceous-green, sub-glaucescent, annual herb, with the habit of an *Asperula*, 3 to 8 in. high, simple or with a few spreading or ascending branches, glabrate except the youngest parts; stem quadrangular or towards the base two-edged; internodes longer than the leaves; leaves ovate or lanceolate, sub-apiculate, not acuminate, broad near the cuneate base, thinly membranous, with 4 or 5 slender not conspicuous veins on each side of the slender midrib, $\frac{1}{3}$ to 1 in. long by $\frac{1}{6}$ to $\frac{1}{2}$ in. broad; petiole $\frac{1}{20}$ to $\frac{1}{8}$ in. long, spreading, slender; stipules from a broad shortly sheathing base narrowed into a long subulate-acuminate ciliolate apex, rather shorter than the petiole; inflorescence terminal axillary or opposite to a leaf, slender, simple or somewhat branched, usually with a subsessile flower at the point of dichotomy or subspicate, few-flowered, ranging up to about an inch long; pedicels mostly very short, but ranging up to $\frac{1}{4}$ in. long; bracteoles very small, subulate; flowers azure-blue, $\frac{1}{3}$ to $\frac{2}{3}$ in. long; calyx-limb 4-partite, $\frac{1}{16}$ to $\frac{1}{12}$ in. long in flower, enlarging to $\frac{1}{8}$ to $\frac{1}{7}$ in. long in fruit, persistent; segments sub-linear in flower, slightly spathulate in fruit, equal or nearly so; corolla-tube slender, salver-shaped, $\frac{1}{4}$ in. long, straight; limb quadrifid, funnel-shaped, $\frac{1}{8}$ in. in diameter; stamens 4; anthers linear-oblong, just exserted at the mouth of the corolla, dorsifixed near the base; filaments very slender, about as long as the anthers; style exserted rather beyond the anthers; ovary campanulate, shorter than the calyx-limb; capsule depresso-globose, somewhat flattened, 2-celled.

Pungo Andongo.—In very shady caves at the summit of the ranges of rocks within the præsidium, in company with *Begonia rostrata* Welw.; fl. and fr. May 1857. No. **3076**.

4. **O. huillensis** Hiern, sp. n.

A hispid-pubescent perennial herb, 6 to 12 in. high; rootstock thick, woody, branched, giving off from its crown numerous stems spreading in all directions; stems simple or branched above, rather slender, somewhat quadrangular and between the angles sulcate; leaves ovate or lanceolate, apiculate at the apex, obtusely narrowed or somewhat wedge-shaped at the base, membranous, herbaceous-green, rather dull, with 3 to 6 inconspicuous lateral veins on each side of the midrib, $\frac{1}{2}$ to $1\frac{1}{4}$ in. long by $\frac{1}{8}$ to $\frac{1}{2}$ in. broad; petioles ranging up to $\frac{1}{3}$ in. long, spreading; stipules truncate, pluri-setose; flowers at first whitish, turning azure-blue, $\frac{1}{3}$ to $\frac{2}{3}$ in. long, arranged in compound terminal hemispherical cymes of about an inch in diameter; ultimate pedicels short or very short; calyx-limb

4-partite, $\frac{1}{8}$ in. long; segments linear, acute; corolla salver-shaped; tube more than twice the length of the calyx-limb; corolla-limb quadrifid; lobes ovate, obtuse, apiculate; anthers at throat of the corolla; style slender, exserted, bifid; ovary campanulate, shorter than the calyx-limb, 2-celled; ovules numerous.

Huilla.—Lopollo; fl. Dec. 1859. No. **5313**.

5. **O. decumbens** Hiern, *l.c.*, p. 54.

Pungo Andongo.—A perennial herb; rootstock thick; stems several, elongated, rooting-decumbent; flowers whitish-purplish. At the damp borders of forests near Muta Lucala by the river Cuanza; fl. and fr. March 1857. No. **3073**.

6. **O. rigida** Hiern, *l.c.*, p. 55.

Mossamedes.—A perennial herb; rootstock thick; stems numerous, twisted, branched from the base, more or less prostrate; leaves almost always lurid- or sordid-purplish; flowers lurid-purple. In rocky sandy places at the base of the mountains of Serra de Montes Negros; fl. and fr. 10 August 1859. No. **5322**. In sandy-muddy maritime stations of Sacco de Giraul; late fr. July 1859. No. **5323**. A small erect annual herb, branched from the base; branches slender; flowers white. In hilly gravelly maritime places amidst a decumbent *Euphorbia*, to the south of the town, abundant; fl. and fr. end of June 1859. An annual form. No. **5324**. An annual herb, much branched by degrees from the base; leaves narrowly linear; flowers white. In damp sandy situations by the river Bero, very abundant and almost forming clumps; fl. and fr. middle of July 1859. An annual form. No. **5325**. A slender erect annual herb, 4 to 12 in. high, sometimes sparingly branched, in other cases very much branched; corolla-tube long, yellowish; corolla-limb quadrifid, milk-white, soon turning violet-blue. In sandy places by the river Bero, near Cavalheiros, very abundant; fl. and fr. end of June 1859. An annual form. No. **5326**. Flowers blue. In sandy thickets near the river Maiombo, Quitibe de Cima; fl. and fr. June 1860. Perhaps a slender annual form of this species. No. **3074**.

Benguella.—An erect, much branched, apparently annual herb, somewhat glaucescent-green; flowers white. In sandy, bushy places about the city; fl. and fr. June 1859. Probably a form of this species. No. **3039**.

7. **O. Welwitschii** Hiern, sp. n.

A puberulous-scabrid annual herb, 3 to 6 in. long; root descending vertically in the form of a narrow screw, about 3 in. deep; leaves all radical, or nearly so, crowded, opposite, forming a rosette, numerous, lanceolate or narrowly elliptical, apiculate, gradually narrowed to the sessile or subsessile base, with revolute margins, $\frac{1}{3}$ to $\frac{3}{4}$ in. long; stipules shortly sheathing; stems nearly reduced to flowering scapes, several, ascending from near the crown of the root, 3 to 7 in. long (including the dichotomous or trichotomous inflorescence), subterete, undivided in the lower half; pedicels ranging up to $\frac{3}{8}$ in. long, but mostly very short; flowers nearly $\frac{1}{2}$ in. long, usually milk-white, but at length some bluish; calyx-limb deeply 4-lobed, with lanceolate persistent not accrescent segments about as long as the campanulate ovary; corolla-tube long, slender, many times exceeding the calyx,

straight, rather widened near the top where the anthers are included; limb 4-lobed; segments ovate, obtuse; capsule broadly urceolate, 2-celled; seeds numerous.

MOSSAMEDES.—In hilly gravelly maritime places near the citadel, in company with species of *Pharnaceum* and *Giseckia*, abundant; fl. and fr. end of June 1859. No. **5327**.

8. **O. cuspidata** K. Schum. in Engl. Bot. Jahrb. xxiii. p. 413 (1896).

HUILLA.—An annual herb; stems several, ascending-erect, obtusely tetragonal, 6 to 12 in. high, the upper part with distant pairs of opposite leaves; leaves linear, erect, ciliate on the margin with hyaline pilose hairs, the lower leaves crowded and smaller; stipules sheathing, truncate, with long setæ at the apex; flowers rosy, like those of *Erythræa*, stipulaceo-involucrate in long-pedunculate dense little cymes, tetramerous; corolla (as also the calyx and stem) scattered outside with hyaline pilose hairs, pallid-rosy outside; the tube and throat naked; the limb deep-rosy or rarely white inside; anthers almost sessile, erect, included; style filiform, shorter than the stamens; stigma oblong, almost claviform-thickened, obsoletely bilobed at the apex, not reaching the anthers; fruit agreeing with the section Kohautia. In pastures and sandy thickets, very abundant and frequent throughout the plateau of Huilla and a great ornament to its pastures; fl. and young fr. Feb. 1860. No. **5341**. At Lopollo, very abundant; fl. and fr. Dec. 1859. No. **5342**.

9. **O. spermacocina** K. Schum., *l.c.*, p. 418.

HUILLA.—An undershrub, 2 to 4 ft. high, with whitish flowers. At a waterfall; fl. and fr. Oct. 1859. No. **5332**. Flowers white. Near Ferrão da Sola, at a cascade; fl. and fr. Jan. 1860. No. **5333**. Perennial, herbaceous or suffruticose, 2 to 3 ft. high; leaves lanceolate, silvery-shining beneath; flowers white. Near Lopollo; fr. Jan. 1860. COLL. CARP. 634.

10. **O. papillosa** K. Schum., *l.c.*, p. 416.

LOANDA.—An erect, substrict, branched herb, 4 to 9 in. high; leaves narrow; flowers from whitish to yellowish. In pastures flooded in summer, near Quicuxe, in company with a species of *Drimia*, rare; fl. and fr. Dec. 1853. No. **3064**.

AMBACA.—An annual erect herb, a foot high; stem slender; leaves linear; flowers (of which only the fragmentary remains were seen) tubular; tube long, straight, very slender. In plantations of *Manihot utilissima* near N-gombe and the river Lucala, abundant; fr. Oct. 1856. An annual erect little herb; in damp places on the left bank of the river Caringa, rare; fr. June 1855. No. **3065**.

PUNGO ANDONGO.—An annual erect herb, a foot high, branched from the base, cylindrical; branches erect, elongated; leaves rather fleshy; stipules sheathing, with several or few teeth; calyx green; tube adnate to the ovary; limb quadrifid, with lanceolate erect lobes, rarely with a fifth or even also a sixth little tooth interposed; corolla pallid-purplish, soon whitish or violet-coloured, salver-shaped, with a slender elongated tube and a slightly dilated straight throat; limb quadrifid; lobes lanceolate, rather obtuse and fleshy, spreading in a stellate manner at the time of flowering, naked and whitish inside; stamens 4, inserted at the base of the throat of the corolla, included; filaments very short; anthers oblong, terminated at the apex with a short blackish appendage; ovary marked with a thin disc,

2-celled ; cells many-ovuled ; style filiform ; stigma obsolete, flattened-bilobed ; capsule obovoid, sub-didymous, crowned with the persistent limb of the calyx, dehiscing loculicidally with a transverse chink within the limits of the calyx-limb ; seeds very numerous, angular, dark brown or obscurely orange-coloured. Among crops or plantations of *Manihot utilissima*, especially on a sandy soil ; fr. and almost past fl. end of Dec. 1856. No. **3066**.

Mossamedes.—An annual herb, scarcely a foot high, branched from the base, glaucescent ; flowers white ; corolla-tube long ; limb quadrifid, milk-white. In sandy places at the river Bero, abundant ; fl. and fr. June 1859. No. **3067**.

Perhaps not distinct from *O. aspera* DC., to which *O. strumosa* Hiern, *l.c.*, p. 58, has been referred.

11. **O. subverticillata** K. Schum., *l.c.*, p. 419.

Huilla.—An annual, erect herb, 1 to 3 ft. high, virgately branched ; stipules 2- to 4-setose ; flowers sub-opposite, distantly spicate ; corolla salver-shaped, of a lurid-violet colour ; limb long, tetragonal, widened below the limb on account of the included anthers ; lobes of the limb 4, ovate-elliptical, muticous. Among crops, especially of *Phaseolus* and *Zea Mays*, also at roadsides, in sandy places, abundant ; fl. and fr. 27 March 1860. No. **5321**.

To this species, which is perhaps not distinct from *O. papillosa* K. Schum., apparently belongs the following No. :—

Pungo Andongo.—An annual, erect, slender, branched herb, 1 to 2 feet high ; flowers from whitish to yellowish. Among low bushes between Mutollo and Candumba ; fl. and fr. March 1857. No. **3040**.

12. **O. caffra** Eckl. & Zeyh. Enum. Pl. Afr. p. 360 (1837) ; Hiern., *l.c.*, p. 58.

Ambriz.—A herb, perhaps perennial ; rootstock thick, becoming woody ; stems much branched ; leaves linear ; stipules subalate-laciniate. In rocky places by the river Onço, Margueriti Mossul ; fl. and fr. Nov. 1853. No. **3037**.

Pungo Andongo.—A slender, annual or perhaps biennial herb, with whitish flowers verging towards a violet tinge. In sandy thickets between Cazella and the river Lutete ; fl. and fr. Jan. 1857. No. **3036**.

Huilla.—Flowers small, white. In rocky places among short bushes, near Lopollo ; fl. and fr. Dec. 1859. Flowers white, with the tube a little reddish. In pastures flooded in the rainy season ; fl. and fr. end of Jan. 1860. A perennial, cæspitose, erect herb ; stems filiform ; leaves linear ; stipules pauci-setose ; corolla white-violet or purple, its tube long, ventricose below the limb ; lobes elliptical. In moist meadows along the river of Lopollo, abundant ; fl. and fr. 27 and 28 March, 1860. No. **3038**.

13. **O. herbacea** Roxb. Hort. Beng. p. 11 (1814).

Hedyotis herbacea L., Sp. Pl., edit. 1, p. 102 (1753). *H. Heynii* Br. in Wall. List, n. 867. *O. Heynei* Miq. Fl. Ind. Bat. ii. p. 187 (1856) ; Hiern, *l.c.*, p. 59.

Golungo Alto.—A very graceful, bright-green, annual herb, with very small white flowers, representing in the tropics the genus *Galium* of the temperate zone. By the Ambaca road, near Canaûlo ; abundant, but in few places ; fl. and fr. beginning of April 1856. At the borders of thickets between Ponte de Luiz Simões and Camilungo, one specimen ; fl. and fr. April 1855. No. **3055**.

PUNGO ANDONGO.—In moist places among rather low shrubs between Condo and Quisonde ; a few specimens, fl. March 1857. No. **3061**.

MOSSAMEDES.—Flowers white. In fields planted with *Zea Mays* L. and *Sorghum*, and after the clearing of the crops ; fl. and fr. from Feb. to April 1860. No. **3057**.

HUILLA.—Flowers whitish. In cultivated fields near Lopollo ; fl. and fr. Feb. 1860. No. **3056**. Flowers white. On lands sown with *Linum usitatissimum*, near Lopollo ; fl. and fr. Feb. 1860. No. **3058**.

14. **O. tardavelina** Hiern, sp. n.

An elegant, somewhat scabrid, annual herb, with the habit of some species of *Tardavel*, 4 to 8 in. high, stem and branches more or less rough, sometimes nearly glabrous, often reddish ; branches opposite or in some cases alternate, divaricate or ascending, lax or not very dense, rather slender ; internodes except the uppermost ones exceeding or about equalling the leaves ; leaves opposite, decussate, sub-linear, mostly apiculate at the apex, sessile, scabrid, spreading, rigid, $\frac{1}{3}$ to 1 in. long, uninerved, the uppermost leaves (or bracts) dilated at the base ; margins much revolute ; stipules adnate to the bases of the leaves and so sheathing, truncate, with a very small tooth in the centre of the transverse apex ; flowers whitish-violet-coloured or mostly red, tetramerous, $\frac{1}{3}$ in. long, sessile or subsessile, arranged several or many together in sessile bracteate terminal and sometimes subterminal heads, dimorphic ; the 2 or 3 uppermost pairs of leaves (or bracts) are approximated and form with their dilated bases and adnate stipules a kind of involucre for the heads of flowers ; calyx $\frac{1}{10}$ in. long ; the tube $\frac{1}{20}$ in. long, somewhat turbinate and compressed, glabrous below ; the limb $\frac{1}{20}$ in. long, 4-partite ; the segments sub-equal, lanceolate-subulate, ciliate, persistent, green ; corolla salver-shaped ; the tube puberulous outside, glabrous or minutely scaly-puberulous inside, $\frac{1}{4}$ in. long ; the throat not bearded ; the lobes $\frac{1}{15}$ in. long, ovate, minutely puberulous outside, minutely scaly inside, valvate in the bud, spreading in the open flower ; stamens 4, shortly exserted in the short-styled flowers, just included in the long-styled ones ; anthers oblong, glabrous ; filaments minutely puberulous, short ; style puberulous, filiform, included or exserted, bilobed above ; ovary 2-celled ; ovules numerous ; capsule depresso-globose, somewhat compressed, glabrous below, hispidulous above, $\frac{1}{12}$ in. in diameter, loculicidal, crowned with the persistent calyx-limb, 2-celled ; seeds numerous, very small, angular.

PUNGO ANDONGO.—In moist pastures, with short herbage, near Muta Lucala ; fl. and fr. March 1857. No. **3229**.

Nearly related to *O. gregaria* K. Schum., but it is without a dense beard in the throat of the corolla.

15. **O. gregaria** K. Schum., *l.c.*, p. 414.

HUILLA.—A delicate erect annual herb, growing in dense masses ; stem tetragonal ; stipules simple from the middle of the sheath, acute ; corolla very slender, purplish-skyblue, with a densely white-bearded throat and a quadrifid limb. In the clefts of moist elevated rocks on the Humpata plateau in Morro de Nene, near Empalanca ; fl. and fr. beginning of April 1860. No. **3053**.

16. **O. stælioides** K. Schum., *l.c.*, p. 418.

Huilla.—Flowers white. In rather poor pastures among short grass, near Lopollo ; fl. and fr. Dec. 1859. No. **5328**.

17. **O. lancifolia** DC. Prodr. iv. p. 425 (1830) ; Hiern, *l.c.*, p. 61.

Pungo Andongo.—An annual little herb, with a filiform stem hanging down from the rocks, and white flowers. At the small cataracts near Tunda-Quilombo, within the præsidium, sparingly ; fl. and fr. May 1857. No. **3059**. In moist fields among crops of Ginguba de Cambamba (*Voandzeia subterranea* P. Thouars), only one specimen ; fl. and fr. Dec. 1856. No. **3060**.

Our specimens differ from the type by the flowers being more frequently not solitary in the axils.

18. **O. corymbosa** L. Sp. Pl., ed. 1, p. 119 (1753) ; Hiern, *l.c.*, p. 62.

Sierra Leone.—Fl. and fr. beginning of Sept. 1853. A form with rather broad leaves. No. **3047**.

Ambriz.—A tender annual herb, with the habit of a *Galium*, subprocumbent or with the stem and branches ascending ; flowers small, white. At the banks of the river Loge, near Quibango, in plantations of *Manihot utilissima*, and in neglected fields near Quibança, abundant ; fl. and fr. Nov. 1853. No. **3044**.

Loanda.—In the cultivated fields about the city ; fl. and fr. May 1854. No. **3041**. In stony hilly places by the sea near Morro da Cruz to the south of Loanda, and in cultivated places, not uncommon ; fl. and fr. 30 April 1854. No. **3042**. Flowers white. In bushy places with short grass, near Imbondeiro dos Lobos ; fl. and fr. Jan. 1858. No. **3043**. A form sometimes with solitary flowers. No. **3043***b*. A tender, much-branched, annual, little herb, with narrow leaves and white flowers. In plantations of *Manihot utilissima* throughout the district ; fl. and fr. March to Sept. Coll. Carp. 635.

Golungo Alto.—About the fazenda of Senhor Luiz Simões ; fl. and fr. A form with rather broad leaves. No. **3045**.

Pungo Andongo.—In moist pastures near the Condo cataract ; also in gravelly and neglected fields throughout the præsidium ; fl. and fr. March 1857. No. **3046**.

Huilla.—Flowers white. In the thickets of Empalanca, flooded in the rainy season, with short grass ; fl. and fr. beginning of April 1860. No. **3049**.

18. **O. capensis** L. f. Suppl. Pl. p. 127 (1781) ; Hiern, *l.c.*

Huilla.—Flowers white. In fields neglected after cultivation, at Ferrão da Sola, abundant ; fl. and fr. June 1859. No. **3050**.

Var. **stagnina** Hiern.

A glabrous or setulose, simple or somewhat branched, annual herb, 1 to $1\frac{1}{2}$ in. high, erect or somewhat spreading ; stem and branches angular ; leaves opposite, linear, obtuse or apiculate at the apex, gradually narrowed to the sessile base, $\frac{1}{4}$ to $\frac{3}{8}$ in. long, spreading ; stipules shortly sheathing, very shortly or obsoletely setose ; flowers axillary, solitary ; peduncles shorter than the fruit, more or less spreading or reflexed ; calyx-teeth 4, subulate from a broad base, shorter than the ovary, persistent, ultimately spreading, not much enlarged on the fruit ; fruit campanulate or somewhat turbinate, $\frac{1}{12}$ in. long, glabrous or with a few scattered adpressed papillæ ; seeds numerous, angular.

HUILLA.—In elevated dried-up swamps, in Morro de Monino ; fr. April 1860. No. **3051**.

Perhaps a distinct species, allied also to *O. cæspitosa* Hiern.

20. **O. juncoides** K. Schum., *l.c.*, p. 414.

PUNGO ANDONGO.—An annual herb with the habit of *Armeria*, much-branched and ascending from the base, rather rough ; stems hispidulous, tetragonal ; leaves erect-spreading or arching-reflexed, herbaceous-green ; flowers white, tetramerous, very deciduous ; corolla white, rotate, its tube short ; limb 4-cleft, clothed with a few white erect pilose hairs. In sandy, rocky, sparingly grassy places, in Mata de Pungo borealis, and at the banks of the river Cuanza near Candumba ; fl. and young fr. end of March and beginning of April 1857. No. **3063**.

21. **O. stellarioides** Hiern, sp. n.

A slender, strict, erect, annual herb, 6 to 9 in. high, with the habit almost of a *Stellaria*, dichotomously branched from the base ; branches erect-spreading, slightly rough, marked with narrow decurrent lines, leafy ; leaves narrow, almost acicular in the dried state, hispidulous, sessile, decurrent, erect-spreading, deep-green, $\frac{1}{4}$ to $\frac{1}{2}$ in. long, closely revolute along the margin towards the midrib ; stipules shortly sheathing or almost obsolete ; flowers small, white, arranged in dichotomous bracteate or leafy, slender, elongating, terminal, erect, centripetal cymes ; pedicels slenedr, ultimately about as long as the fruit, solitary at the divisions of the cyme ; calyx-limb 4-partite ; segments equal, lanceolate, acute, hispidulous, persistent, $\frac{1}{20}$ in. long, often with a squarrose tip ; corolla scarcely exceeding the calyx, quadrifid ; stamens 4 ; fruit broadly campanulate, about as long as the calyx-limb, somewhat compressed ; seeds several, minutely punctate.

PUNGO ANDONGO.—In rocky, sparingly grassy places near Muta Lucala, rather rare ; fl. and young fr. end of March 1857. No. **3052**.

In habit it agrees with *O. stælioides* K. Schum., but the inflorescence is different.

22. **O. rosulata** K. Schum., *l.c.*, p. 416.

HUILLA.—A very slender little herb, apparently annual, with the aspect almost of *Millegrana* ; stem filiform, dichotomous or trichotomous, nearly erect or oblique ; leaves of two forms ; stipules scarcely any, represented by a glandular swelling ; corolla tubular-campanulate, with a quadrifid limb and shaggy throat, of a pallid-violet colour outside, whitish inside, at length turning sky-blue in the course of drying. In marshy situations with dense herbage, in varzeas (moist meadows) along the river Monino ; fl. and fr. 2 Jan. 1860. No. **5320**. A very graceful annual herb ; stem dichotomous, ascending or nearly erect, tetragonal ; stem-leaves distant, opposite, lanceolate, long-attenuate at the base ; stipules obsolete or rather substituted by an interpetiolar membrane, glandular-pilose on the margin ; peduncles axillary and terminal, elongated, capillary, trichotomous or simple ; flowers small, tetramerous, white-purplish. In grassy situations on the plateau of Humpata near Empalanca, sparingly ; fl. and fr. April 1860. No. **5319**.

The following No. should be compared with this species :—

HUILLA.—A weak erect annual herb, scarcely 2 in. high, growing in dense masses ; flowers from whitish to sky-blue. In exposed sparingly grassy places in Morro de Lopollo, flooded in the rainy season ; fl. and

fr. beginning of April 1860; also in elevated mossy pastures near Humpata, in company with species of *Xyris* and *Isoëtes*; fl. and fr. April 1860. No. **3054**.

23. **O. pellucida** Hiern, sp. n.

A tender erect annual herb, herbaceous-green, glaucescent, growing in dense masses; stem simple, 2 to 3 in. high, slender, somewhat compressed, quadrangular, hispidulous on the angles; leaves elliptical or somewhat ovate, apiculate not acuminate at the apex, more or less abruptly wedge-shaped at the base, thinly membranous, glabrous or nearly so except the thinly ciliate margin, pellucid-punctate, $\frac{1}{4}$ to 1 in. long by $\frac{1}{6}$ to $\frac{3}{8}$ in. broad; petiole $\frac{1}{10}$ to $\frac{1}{6}$ in. long; stipules multifid, with sub-hyaline fringe-like segments; flowers milk-whitish, about $\frac{1}{8}$ in. long, on very short pedicels 3 to 6 together at the apex of the stem or solitary in the upper axils; calyx-teeth 4, very loosely surrounding at the base the slender corolla-tube and about half its length, persistent, not accrescent; corolla-limb quadrifid, its lobes milk-white, obovate, rather obtuse, abruptly acuminate; anthers sub-exserted; capsule 2-celled, puberulous.

Huilla.—On the moist sides of streams on the plateau of Humpata near Empalanca; fl. and fr. middle of April 1860. No. **5344**.

24. **O. benguellensis** Hiern, sp. n.

An erect glabrate shrub, 2 to 4 ft. high, with an Umbelliferous habit; branches mostly opposite, spreading, terete, shining; branchlets leafy; leaves sub-linear, somewhat scabrid above, sessile, $\frac{3}{4}$ to 2 in. long, margins revolute along the midrib; stipules sheathing, truncate; inflorescence terminal, repeatedly branched, corymbose, bracteate, in fruit ranging from 1 to 3 in. in diameter; ultimate pedicels shorter than or rather exceeding the fruit; calyx-limb 4-partite, with ovate not accrescent segments; corolla somewhat exceeding the calyx, quadrifid, with valvate lobes; style bifid; fruit campanulate, slightly compressed, about $\frac{1}{8}$ in. long, glabrous, 2-celled, loculicidal; seeds numerous, somewhat angular.

Mossamedes.—In mountainous rocky places at the banks of the river Maiombo; in old fr. Oct. 1859. No. **5353**. In hilly, bushy, stony places, by the river Maiombo, abundant; fl.-bud and fr. Oct. 1859. No. **5354**.

Huilla.—In rather dry thickets between Mumpulla and Nene; fr. Oct. 1859. No. **5355**.

25. **O. nesæoides** Hiern, sp. n.

An erect annual herb, 4 to 12 in. high, nearly simple or with suberect or ascending branches from the base upwards, rather slender; stem and branches quadrangular, hispidulous; leaves opposite, elliptical or somewhat lanceolate, mostly narrowed towards both ends, pointed or apiculate at the apex, more or less wedge-shaped at the base, membranous, flat except the narrowly revolute margin, slightly hispidulous especially along the nerves beneath, becoming very pale and glaucescent beneath, $\frac{1}{2}$ to $1\frac{1}{2}$ in. long by $\frac{1}{8}$ to $\frac{1}{2}$ in. broad; lateral veins about 4 on each side of the

midrib, not conspicuous; petiole hispidulous, $\frac{1}{12}$ to $\frac{1}{4}$ inch long; stipules broadly ovate or subtruncate, with 5 to 7 setaceous segments, shorter than or nearly equalling the petioles, puberulous; flowers arranged in small terminal and axillary dense clusters (more or less elongating and interrupted in fruit), sessile or subsessile, white, $\frac{1}{8}$ in. long; clusters sessile or subsessile or basec by a pair of foliaceous bracts; bracteoles small, linear-lanceolate; calyx $\frac{1}{8}$ in. long, more or less setose with whitish hairs; limb 4-partite, about $\frac{1}{12}$ in. long in flower, $\frac{1}{8}$ in. long in fruit; segments lanceolate, nearly equal, glabrous and glossy inside; corolla glabrous or nearly so, $\frac{1}{8}$ in. long; tube slender, narrowly funnel-shaped; limb small, 4-cleft, valvate in æstivation; lobes roundly ovate; throat naked; stamens 4, inserted at the bottom of the throat; filaments rather short; anthers free, partly exserted; style slender, rather glandular or stigmatose on the upper part, shortly exserted, bifid above; ovary 2-celled, campanulate, somewhat compressed; cells many-ovuled; fruit equally 2-celled, dehiscing at the apex, setose, crowned with the persistent calyx-lobes, many-seeded; seeds somewhat angular.

Huilla.—On the more elevated rocks of Monino among plants of Massambala, not common; fl. and fr. April, 1860. No. **5346**.

26. **O. angolensis** K. Schum., *l.c.*, p. 412.

Huilla.—A glabrous, glaucescent, pale-green, apparently perennial herb, 4 to 12 in. high, with the habit of a *Silene* or *Epilobium*, root more or less creeping; stems numerous, procumbent, ascending; the flowering ones 6 to 12 in. high, leafy below, all simple above; leaves opposite, narrowly elliptical, apiculate at the apex, gradually narrowed towards the sessile base, herbaceous, uni-nerved, narrowly revolute and scabrid on the margin, $\frac{1}{2}$ to $\frac{2}{3}$ in. long, $\frac{1}{12}$ to $\frac{1}{4}$ in. broad, pairs distant on the upper part of the flowering stems; stipules bidentate, ciliolate; flowers purplish, crowded many together in sessile bracteate contracted terminal capitate cymes which are hemispherical in flower and become ovoid in fruit; pedicels short; calyx-limb 4-partite, lanceolate, persistent, shorter than the fruit; corolla not much exceeding the calyx; fruit subglobose, somewhat compressed, $\frac{1}{12}$ in. in diameter, glabrous. In herbaceous wooded places near Catumba; fl. and fr. Feb. and April 1860. No. **5343**.

Our specimens differ in respect of habit and the shape of the leaves, etc., from the description of the species quoted above, but they fairly agree with a poor specimen of the type seen in the Kew herbarium. The following perhaps belongs to the same species :—

Huilla.—Annual. In fields near Lopollo, rather rare; fr. Feb. 1860. Coll. Carp. 636.

27. **O. trinervia** Retz, Obs. Bot., fasc. iv. p. 23 (1786); Hiern, *l.c.*, p. 63.

Ambriz.—In moist pastures near the town, fr. Nov. 1853. No. **3077**. A tender little annual herb, 3 to 4 in. long; stem weak, bright green; leaves membranous, bright green; calyx campanulate, adnate to the ovary; lobes 4, ovate-lanceolate, acutely pointed, ciliate with long hyaline hairs; corolla deeply 4-cleft, white, with a very short tube and ovate segments scarcely exceeding the calyx; stamens 4; filaments very short; anthers turning nearly black. In fields neglected

after cultivation, between Ambriz and Mubango, near the river Loge, rather scarce ; fl. and fr. July 1854. Also in plantations of *Manihot utilissima* in Loanda, Nov. 1859. No. **3079**.

Pungo Andongo.—A decumbent, apparently annual herb, rooting at the nodes, with a Violaceous habit, and whitish flowers. By springs in Funda Quilombo, within the præsidium ; fl. and fr. Jan. 1857. No. **3078**.

28. **O. macrophylla** DC. Prodr. iv. p. 427 (1830); Hiern, *l.c.*, p. 63.

Ambriz.—At a rivulet near the town, close to the springs, rare ; fl. Nov. 1854. No. **3069**.

Barra do Dande.—An annual prostrate herb, with pale-blue flowers. In damp places at the banks of the river Dande near its mouth, here and there ; fl. and fr. Sept. 1858. No. **3070**.

Barra do Bengo.—In moist places at the river Bengo near Quifandango, sporadic ; fr. and few fl. Dec. 1853. In damp places at the river Bengo, rather rare ; fl. and fr. Jan. 1854. No. **3072**.

Golungo Alto.—A glaucescent, prostrate-ascending, annual herb, with milk-white flowers. At the grassy banks of the river Casabala in Sobato de Bumba, not very abundant ; fl. and fr. Dec. 1855. No. **3068**.

Ambaca.—An annual marsh herb, with milk-white somewhat bluish flowers. In swamps at the banks of the river Lucala : fl. middle of Oct. 1856. No. **3071**.

The following No. should be compared with this species :—

Huilla.—In herbaceous places at the borders of the forest near Catumba. A young plant without either fl. or fr. Jan. 1860. No. **5345**.

29. **O. ramosissima** Hohen. ex Walp. Rep. ii. p. 502 (1843).

O. hedyotoides Boiss. Fl. Orient. iii. p. 11 (1875) ; Hiern, *l.c.*, p. 64.

Libongo.—An annual, rather rigid, divaricately branched, little herb, with a Lythraceous habit ; stem and branches angular ; leaves opposite, linear-lanceolate, spreading, bright-green : stipules shortly sheathing, 2- or 3-toothed ; calyx-segments 10, erect-spreading or patent ; corolla whitish (only one seen) ; ovary campanulate, 2-celled ; cells many-ovuled ; seeds numerous, angular, very small. In exposed situations on a black sandy soil at the banks of the river Lifune near Banza de Libongo ; fr. end of Sept. 1858. No. **3062**.

The following No., with solitary flowers in the axils, is perhaps a variety of this species :—

Mossamedes.—A rather small, prostrate, annual herb ; branches several ; stems purplish, ascending ; leaves linear ; flowers rather small, white. In damp sandy places at the banks of the river Bero and about its mouth ; fl. and fr. end of July and in August 1859. No. **3048**.

30. **O. nervosa** Hiern, sp. n.

An annual, ascending or erect, glabrous, glaucescent herb, $2\frac{1}{2}$ to 4 ft. high ; stem acutely quadrangular, the angles membranous-winged ; leaves ovate or lanceolate, acuminate, acute at the apex, more or less wedge-shaped at the base, membranous, flaccid, bright-green above, paler beneath, with several very prominent veins, 1 to $3\frac{1}{2}$ in. long by $\frac{1}{4}$ to $1\frac{1}{2}$ in. broad ; petioles ranging up to $\frac{3}{4}$ in. long, slender, usually spreading ; stipules truncate, multi-setose ; flowers about $\frac{1}{10}$ in. long, tetramerous, terminal and in the upper axils, arranged in compound loosely-branched cymes of $\frac{1}{2}$ to

1½ in. in diameter; ultimate pedicels very short; calyx-segments lanceolate, acute, about equalling the tube of the corolla, persistent; corolla elongate-campanulate, from milk-white to azure-blue; lobes valvate in the bud, erect-spreading in open flower; ovary campanulate, green; fruit 2-celled, depresso-globose, somewhat compressed.

GOLUNGO ALTO.—On herbaceous slopes on the right bank of the river Delamboa and at the back of Rodrigo's house; fl. and fr. 24 March 1856. No. **5306**. At the skirts of primitive forests in the deep valleys of Mount Cungulungula, rather rare; fl. and fr. Feb. 1855. No. **5307**.

PUNGO ANDONGO.—In grassy wooded parts of the island Calemba in the river Cuanza; fl. and fr. 12 March 1857. No. **5305**.

31. **O. golungensis** Hiern, sp. n.

An erect or ascending, sparingly branched, apparently annual herb, 18 to 24 in. high; stem slender, obtusely quadrangular, furrowed, shortly pubescent at least along the furrows; leaves elliptical or more or less lanceolate, gradually or abruptly narrowed at both ends, membranous, puberulous, green and rather shining above, paler beneath, 1¼ to 2½ in. long by ⅖ to 1 1/10 in. broad; lateral veins slender, 5 or 6 on each side of the midrib; petiole ⅕ to ½ in. long, shortly pubescent; stipules broad, truncate, tipped with several long subulate teeth; flowers several together, clustered in terminal pedunculate heads; peduncle rather long; pedicels very short; heads small, ⅜ in. in diameter, bracteate at the base; bracts sub-linear, puberulous, ciliate, about as long as the head; bracteoles similar, smaller; capsules puberulous, campanulate, ⅛ in. long, crowned with the persistent small subulate calyx-teeth, 2-valved, many-seeded; seeds reddish brown, punctate, with rounded angles.

GOLUNGO ALTO.—No notes. No. **3083**.

11. **JUSTENIA** Hiern, gen. nov.

Calyx-tube short, adnate, campanulate and somewhat compressed in flower, subglobose in fruit; limb 5-partite; lobes linear, persistent. Corolla-tube very short; limb deeply 5-lobed; lobes ovate-lanceolate, acute, subulate, valvate in æstivation, induplicate-valvate towards the apex, apparently erect in open flower; throat woolly; anthers 5, linear-lanceolate, 2-celled, dehiscing longitudinally, apiculate at the apex, shortly sagittate or lobed at the base, dorsified near the base, subsessile at the throat between the bases of the lobes of the corolla. Disk elevated, epigynous, compact, glabrous. Ovary 2-celled; style from the centre of the disk cylindrical, pubescent, soon gradually thickened and club-shaped; stigma thick, laminated, the lamina vertical, very thin, whitish-pellucid, contorted; ovules numerous, inserted on the thin placentas. Fruit pea-shaped, indehiscent, globose or slightly compressed and furrowed down two opposite sides, completely or incompletely 2-celled. Seeds numerous, angular.

A climbing shrub, with opposite shortly petiolate thinly

coriaceous leaves, interpetiolar long-subulate undivided stipules, and small flowers in short subsessile or sessile bracteolate terminal clusters.

Named in honour of Mr. Frederick Justen, F.L.S., an intimate friend and one of the acting executors of Dr. Welwitsch.

1. **J. orthopetala.**

A scandent much-branched shortly pubescent shrub; branches and branchlets opposite, quadrangular, flexuous, variously curved and arched, at length hanging down, densely pubescent towards the extremities; leaves opposite, ovate, pointed and apiculate at the apex, rounded or nearly so at the base, papery-coriaceous, glabrous except the ciliolate margin the puberulous midrib and the 2 or 3 pairs of slender lateral veins, apparently deciduous, $\frac{3}{4}$ to 2 in. long by $\frac{1}{3}$ to 1 in. broad; petiole about $\frac{1}{12}$ in. long, pubescent; stipules interpetiolar, connate below, shortly sheathing, lanceolate, subulate, prolonged, persistent; flowers about $\frac{1}{6}$ in. long, sessile or subsessile, densely crowded, several together in pubescent clusters of $\frac{1}{3}$ to $\frac{1}{2}$ in. in diameter; bracteoles stipuliform, small, pubescent; calyx about $\frac{1}{8}$ to $\frac{1}{6}$ in. long, pubescent; tube short; lobes of the limb rather unequal, $\frac{1}{10}$ to $\frac{1}{6}$ in. long, pubescent or on the fruit subglabrous outside, glabrous inside; corolla white, rather fleshy, $\frac{1}{2}$ in. long; tube very short, glabrous inside below the bearded throat; lobes $\frac{1}{10}$ in. long, straight, somewhat hairy on the back; anthers $\frac{1}{15}$ in. long, glabrous; style rather shorter than the corolla; fruit $\frac{1}{6}$ to $\frac{1}{4}$ in. in diameter, baccate (Welw.), several together, subsessile, in clusters of about $\frac{1}{2}$ in. in diameter; seeds angular, subpyramidal, about $\frac{1}{24}$ in. long, glabrous, minutely punctate.

Golungo Alto.—In primitive forests and their outskirts among the mountains of Queta, sporadic but not uncommon; near Caenso, fr. beginning of August 1855; near Capopa, fl. end of August; near Guhanho, fl. beginning of Nov. 1855. No. **3165**.

12. **MUSSÆNDA** Burm., L.; Benth. & Hook. f. Gen. Pl. ii. p. 64.

1. **M. rivularis** Welw. ms. in Herb..

A stout shrub, climbing far and high to 30 ft.; branches obtusely angular ferruginously hispid-tomentous and leafy towards the extremities; leaves opposite, oval or more or less ovate, shortly acuminate apiculate or obtuse at the apex, obtuse or more or less wedge-shaped and often unequal at the base, thinly coriaceous, hispid-pubescent on both faces especially along the principal reddish-brown veins beneath, lamina rather paler green beneath, $3\frac{1}{2}$ to 6 in. long by 2 to 3 in. broad, lateral veins 10 to 12 on each side of the midrib; tertiary veins sub-transverse; petiole $\frac{1}{3}$ to $\frac{1}{2}$ in. long, ferruginously hispid-tomentose; stipules ovate, or lanceolate from a broad base, ferruginously hispid-tomentose outside, usually bifid in the upper half, about $\frac{3}{8}$ in. long, segments subulate; flowers bright yellow, arranged in terminal, rather densely hemispherical, ferruginously hispid-tomentose cymes about 6 in. in diameter; bracteoles ovate, rather

small; calyx hispid-tomentose; tube campanulate-oblong, about $\frac{1}{4}$ in. long, tipped with 4 erect half-oval or oblong obtuse lobes $\frac{1}{12}$ to $\frac{1}{6}$ in. long, and usually with one or two milk-white or sulphur-whitish foliaceous obovate-oblong or sub-orbicular somewhat hispid-pubescent enlarged lobe about 2 in. long, but sometimes all the 5 calyx-teeth are quite equal; corolla yellow, narrowly salver-shaped, hispid-tomentose with downward hairs outside; tube about $\frac{7}{8}$ to 1 in. long; limb about $\frac{3}{8}$ in. in diameter; fruit ellipsoidal, shortly hipsidulous or subglabrate, about $\frac{2}{3}$ to $\frac{3}{4}$ in. long, crowned with the remains of the calyx-teeth.

HUILLA.—In dense forests by cataracts near Lopollo, very abundant, in company with *Epilobium hirsutum* L., *Osmunda regalis* L., and species of *Rumex*, *Blyxa*, *Eriocaulon*, etc.; fl. and fr. almost during 7 months, Dec. 1859, Jan. and 5 April 1860. No. **1118**, and COLL. CARP. 9.

Related to *M. Afzelii* G. Don, but with longer calyx-teeth.

2. **M. arcuata** Lam. ex Poir. in Lam. Encycl. Méth. iv. p. 392 (1796); Hiern in Oliv. Fl. Trop. Afr. iii. p. 68.

CAZENGO.—In rather elevated bushy situations from Dalatanda towards the confines of the district of AMBACA, at about 2000 ft. alt., sporadic; fl. Jan. 1855. No. **1121**.

PUNGO ANDONGO.—A twining scandent shrub, 3 to 5 ft. long, resembling a jessamine in its habit and flowers; stems numerous from the crown of the root, sometimes standing erect but mostly climbing as well as the branches; branchlets erect-spreading; leaves opposite, evergreen, thinly coriaceous, lurid-green; stipules gradually acuminate from a broad base, rather fleshy; flowers pentamerous, handsome, shining with a golden hue; calyx-teeth all equal, lanceolate, subulate or acute, persistent, crowning the fruit; corolla golden-yellow, shining; lobes obovate; tube cylindrical, double as long as the lobes, densely pilose inside on the upper part, rather naked towards the base; throat tawny-bearded; style reaching the middle of the corolla-tube; stigma bilobed, the lobes obovate-oblong, somewhat flattened; fruit baccate. In wooded moist sandy secondary thickets between Luxillo and Cazella; fl. 6 Jan. 1857. No. **1120**. In wooded thickets near the cataract of Condo, sporadic and rather rare; fl. and young fr. March 1857. No. **1120***b*.

3. **M. tenuiflora** Benth. in Hook. Niger Fl. p. 392 (1849); Hiern, *l.c.*, p. 69.

GOLUNGO ALTO.—A very elegant shrub, scandent, with long sarmentose branches; bark fuscous-whitish; branches and branchlets flexuous-tortuous; leaves more or less cuspidate at the apex, shortly attenuate or rounded at the base; calyx green, the enlarged lobe foliaceous, white, soon turning a whitish-sulphur colour; corolla-tube yellow-greenish; the limb especially inside coloured brilliant-orange, subvelutinous; the throat shaggy and closed with long golden-coloured hairs. In primitive forests among the mountains of Serra de Alto Queta, sporadic; fl. end of Dec. 1855; fr. April and June 1856. No. **1117**.

Our specimens differ from the type by a less hispid exterior of the corolla-tube, by subglabrate fruit, etc.

4. **M. erythrophylla** Schum. & Thonn.in Dansk. Vidensk. Selsk. iii. p. 136 (1828); Hiern, *l.c.*; Ficalho, Pl. Uteis, p. 198 (1884).

M. splendida Welw. in Trans. Linn. Soc. xxvii. p. 36, t. 13 (1869).

Golungo Alto.—A graceful shrub, climbing to a great height; by far the most beautiful of African shrubs; upper part of the stem clothed with spreading hairs; leaves rather obtuse or even in some cases subcordate and occasionally attenuate at the base, very bright green on the upper face, pale glaucous-green and hispidulous-hirsute on the purple nerves beneath; stipules ovate, acuminate; calyx beset throughout with rather rigid substantial hairs rather dense on the nerves of the lobes and elsewhere comparatively distant, one lobe developed into a very large bright scarlet-blood-red lamina; outer face of the corolla similarly beset with rather rigid substantial hairs; corolla-limb coloured pallid-orange inside; the throat quite closed with whitish-sulphur-coloured, long, rigid, very dense, exserted hairs; ripe fruit baccate, oblong, crowned with the persistent calyx-lobes; seeds very numerous, minute, lenticular, black, flattened, scrobiculate-scabrid, embedded in pulp. In moist wooded places in Sobato de Bumba; fl. 12 Dec. 1854; also in primitive forests and in neighbouring thickets in Sobato de Quilombo-Quiacatubia, and about Bango Aquitamba, abundant; fl. and fr. Jan. to May 1855. From 2000 to 3000 ft. alt. Negro name "Dilula," "Dilula-Riula," or "Diluia," or "Alleluia." No. **1116**. Mata de Quisucula; fr. July 1856 and 1855. Coll. Carp. 141. Calyx-lobes very large, brilliantly scarlet; corolla of a deep sulphur colour. In the forest of Sobato Quilombo, Queta, Mussengue, and Bango; fr. June 1855. Coll. Carp. 638 and 639.

Pungo Andongo.—A climbing shrub of 5 to 6 ft.; enlarged calyx-lobe purple. In rocky thickets at the borders of the primitive forest of Mata de Pungo within the præsidium, rather rare; fl. Jan. 1857. No. **1115**.

The flowering branches of this beautiful climber were used by the missionaries at Bango Aquitamba to ornament the church of the mission at Easter. The inflorescence much resembles that of *Euphorbia pulcherrima* in brilliancy and floral effect; and it sometimes almost completely covers low trees with its glowing garlands.

5. **M. elegans**, Schum. & Thonn., *l.c.*, p. 137; Hiern, *l.c.*

Golungo Alto.—A sarmentose climbing shrub, with membranous leaves, deep-cinnabar-red flowers, and deciduous calyx-limb. In the thickets of primitive forests among the mountains of Alto Queta, sporadic; fl. and fr. March and April 1856. No. **1119**. A scandent shrub, with bright-green leaves paler beneath and with deep-scarlet flowers; at Capopa, fl. Feb., fr. March 1856. Coll. Carp. 637.

13. **SABICEA** Aubl.; Benth. & Hook. f. Gen. Pl. ii. p. 72.

1. **S. venosa** Benth. in Hook. Niger Fl. p. 399; Hiern in Oliv. Fl. Trop. Afr. iii. p. 77.

Golungo Alto.—A twining shrub; stem slender, 6 to 9 ft. long, furrowed, angular, turning blackish-red; leaves herbaceous, rather rigid, opaque-green above, becoming whitish beneath, with the reddish nerves covered with white rigid hairs adpressed in lines; calyx-tube produced above the ovary, including the tubular truncate obtusely pentagonal disk; calyx-lobes foliaceous, green, long-ciliate on the margin; corolla whitish outside, the tube bright red, sparingly pilose inside, more densely pilose at the throat; segments of the limb bearded with long white hairs; ovary 4- or rarely 5-celled, adnate to the lower part of the calyx; style included in the corolla-tube; stigma deeply divided into rather flat lobes. In thickets and reed-beds along the base of the mountains of Queta; fl. 8 Oct. 1855.

No. **4744**. A low suffruticose herb, extensively and intricately climbing; flowers white. In secondary thickets at the base of the mountains of Queta, at Zengas; fl. Feb. 1856. No. **4745**.

The following No. represented by a specimen without corollas is doubtfully placed here:—

Sierra Leone.—A widely climbing shrub; calyx-lobes foliaceous, lanceolate, twice as long as the calyx-tube. In mountainous forests near Freetown: young fr. after the fall of the corolla, Sept. 1853. No. **3085**.

14. **HEINSIA** DC.; Benth. & Hook. f. Gen. Pl. ii. p. 77.

1. **H. jasminiflora** DC. Prodr. iv. p. 390 (1830); Hiern in Oliv. Fl. Trop. Afr. iii. p. 81.

Golungo Alto.—A very much branched shrub; leaves not coriaceous; stipules emarginate, with 2 horns; flowers in small cymes on long peduncles 1, 2, or mostly 3 together, but little fragrant; calyx-tube obconical, obtusely 5-ribbed, adnate to the ovary; the limb superior a little longer than the tube, 5-partite; the segments foliaceous, broadly lanceolate, spreading-erect, scarcely shorter than the exserted corolla-tube, with subulate glands inside at the base; corolla salver-shaped, brightly white, the limb 5-cleft; lobes ovate or ovate-lanceolate, longitudinally pervaded with wavy lines, fringed on the margin, spreading horizontally; throat closed with rigid yellowish hairs; stamens 5, attached at the middle of the very hairy corolla-tube; anthers linear, dorsifixed, 2-celled, included, densely surrounded with the hairs of the corolla-throat; ovary 2-celled; style seated on the elevated disk; exserted by $\frac{1}{2}$ in.; stigma bilobed, occasionally trilobed; lobes foliaceous, oblong; ovules indefinite. By streams in wooded situations in Sobato de Bumba, along the high road leading to Bango Aquitamba, abundant, fl. 12 Dec. 1854; between Bango and Quisucula, nearly ripe fr. May 1856. No. **2562**.

2. **H. benguelensis** Welw. ex Benth. & Hook. f., *l.c.*; Hiern, *l.c.*, p. 82.

Huilla.—An undershrub, 6 in. high; stems several from a woody rootstock, erect decumbent or prostrate-ascending, rigid; leaves evergreen, lanceolate, shortly petiolate, pubescent on both faces, hirsute along the nerves beneath; flowers fragrant; calyx herbaceous-green, closely surrounded at the base with bracts in pairs; calyx-lobes furnished at the base inside with red subulate glands; corolla milk-white, pubescent-tomentose outside and chiefly on the tube inside; anthers included to a great extent but scarcely exserted at the apex, attached about the middle to the very short filaments; disk with several (8—10?) ribs and a hairy crown; ovary 2-celled; style simple, glabrous below, somewhat hairy from the middle towards the apex; stigma large, bilobed; lobes ovate-oblong, rather compressed, densely hairy on the outer face, stigmatose on the inner; ovules indefinite, densely clustered in a viscid mass. In rocky-sandy thickets between Humpata and Mumpulla, at an elevation of 4200 to 4500 ft., sporadic, in company with species of *Thesium*, Thymelæaceæ and *Thunbergia angolensis* S. Moore; fl. Oct. and beginning of Nov. 1859. No. **2563**.

3. **H. tomentosa** Welw. ms.

An undershrub, softly and loosely tomentose, decumbent-erect from a woody rhizome; stems simple or sparingly branched at or a little above the base, sub-quadrangular, sub-glabrate and

dark-ashy towards the base; branches opposite; leaves obovate-oblong or broadly oblanceolate, cuspidate pointed or rounded at the apex, wedge-shaped towards the unequal base, dull green above, paler and silky-tomentose beneath, rather thick but not coriaceous, 2½ to 4½ in. long by 1 to 1¾ in. broad; lateral veins numerous, clothed with dense spreading hairs beneath; petiole ¼ to ⅜ in. long; stipules ovate-lanceolate, gradually long-acuminate, exceeding the petioles, undivided; flowers fragrant, white, axillary, solitary, 2 to 3 in. long; peduncles an inch long; calyx obconical, herbaceous-green, sub-costate, nearly an inch long; limb much exceeding the tube, 5-partite, the segments erect-spreading, linear-spathulate or lanceolate, acute, a little unequal, ½ in. long or rather longer, furnished inside at the base with subulate coloured glands; corolla salver-shaped; tube cylindrical, much exceeding the calyx-limb, about 2 in. long, densely tomentose outside, sparingly pilose or almost naked inside, its limb 5-partite, the lobes lanceolate, acute, spreading at the time of the flower, about ¾ in. long, imbricate in the bud; throat pilose; anthers included, subsessile, linear, nearly ½ in. long, subulate, acute at the apex, dorsifixed, inserted a little below the corolla-throat; disk epigynous, elevated; ovary 2-celled; cells with indefinite ovules; placentas adnate to the septum.

Pungo Andongo.—In dense forests, on a ferruginous-sandy soil, at the base of the mountains of Serra de Pedras de Guinga, near Candumba; fl. Jan. 1857. No. **3084**.

15. **BERTIERA** Aubl.; Benth. & Hook. f. Gen. Pl. ii. p. 77.

1. **B. macrocarpa** Benth. in Hook. Niger Fl. p. 394 (1849); Hiern in Oliv. Fl. Trop. Afr. iii. p. 84.

Prince's Island.—A small tree or arborescent shrub, 6 to 10 ft. high; trunk straight; branches patent; leaves coriaceous, rather glossy; flower-buds from whitish to slightly rosy. In dense rather elevated forests, on the way towards Pico de Papagaio, sporadic; young fl. Sept. 1853. No. **3086**.

16. **DICTYANDRA** Welw. ex Benth. & Hook. f. Gen. Pl. ii. p. 85.

1. **D. arborescens** Welw., *l.c.*; Hiern in Oliv. Fl. Trop. Afr. iii. p. 86.

Golungo Alto.—A considerable tree of 15 to 35 ft. high in the primitive forests, but in the secondary woods a stout shrub of 8 to 12 ft.; trunk dark grey; trunk sometimes attaining 2 to 2½ ft. in diameter; timber used for hut-building; branches opposite, widely spreading, very much elongated and leafy; branchlets compressed tetragonal; leaves evergreen, chartaceous-coriaceous, rigid, black-green on both faces or rather paler beneath; nerves impressed; stipules sheathing, ovate, gradually acuminate from a very broad base, persistent; flowers rigidly coriaceous; calyx herbaceous-green, campanulate at the time of the flower, its lobes glandular at their base, the glands cylindric-subulate, erect, black, grouped two or three together; corolla herbaceous-green outside, canescent, salver-shaped, the lobes of the limb quickly inflected, convolute at their margins, greenish-yellow inside, the tube turning milk-white, naked inside, a little dilated towards its base, inserted between the calyx-throat and the thick milk-

white obtusely 5-lobed elevated cup-shaped disk; stamens 5, inserted at the corolla-throat, exserted; filaments obsolete; anthers sessile, lanceolate-linear or ovate-oblong, gradually narrowed, acuminate at the apex, several-celled; the cells 40 to 50, arranged in four rows along the whole internal face of the anther; ovary covered by the calyx, 2-celled, with numerous ovules in each cell; style thick, cylindrical, narrowed at both ends, left far exserted by the turning back of the corolla-limb, densely white-pilose except the base, deeply bifid at the apex, with subulate lobes. In elevated forests and wooded slopes among the mountains of Serra de Alto Queta; fl.-bud June and beginning of Aug. 1855; fl. Nov. 10th, 1855; in Mata de Quisucula, ripe fr. end of April 1856. Native name "Mungolo oamxi." No. **2561**. A moderate-sized tree with evergreen leaves. Virgin forest of Quisucula; fr. April 1856. COLL. CARP. 640. A tree, 25 to 35 ft. high; trunk 8 to 12 in. in diameter; structure of the anthers remarkable, honeycombed; berries resembling in shape the fruit of *Psidium*. Among the mountains of Central Queta. COLL. CARP. 641 and 641*b*.

17. **TARENNA** Gaertn. Fruct. i. p. 139, t. 28, f. 3 (1788).

Webera Schreb. (1791); Benth. & Hook. f. Gen. Pl. ii. p. 86. *Chomelia* L. Gen. Pl. edit. 1, p. 55 (1737), non Jacq. (1760).

1. **T. congensis** Hiern in Oliv. Fl. Trop. Afr. iii. p. 91.

Chomelia congensis O. Kuntze, Rev. Gen. Pl. i. p. 278 (1891).

GOLUNGO ALTO.—A copiously leafy tree of moderate size, with very patent almost horizontal branches; calyx 5-toothed; berries purplish, rather dry, 2-celled, crowned with the persistent calyx-lobes; the cells with about six or seven peltate seeds. In elevated forests, 2800 ft. alt. on Mount Cungulungulo; fr. Feb. 1855. No. **2575**.

18. **RANDIA** Houst. ex L.; Benth. & Hook. f. Gen. Pl. ii. p. 88.

1. **R. lucidula** Hiern, sp. n.

A bush 6 to 8 ft. high, or a small tree with spreading elongated and often sub-sarmentose nodding branches, glabrous and rather glossy in most parts; leaves opposite, oval or oblong, acuminate at the apex, obtuse or sub-cuneate at the base, thinly coriaceous, 2 to 7 in. long by 1 to 2¾ in. broad, pallid at least beneath; lateral veins slender, about five to seven on each side of the midrib; petiole ⅛ to ½ in. long; stipules lanceolate or ovate, tapering into a subulate apex, about as long as the petiole, deciduous; flowers about ⅜ in. long just before expansion, pentamerous, on pedicels of ⅛ to ¼ in. long, arranged in many-flowered axillary bracteolate cymes about an inch in diameter; bracteoles ovate or lanceolate, ciliolate, small, deciduous; calyx-limb cup-shaped, nearly glabrous, ⅛ in. long, broader than the ovary, truncate with five minute ciliolate teeth; corolla whitish, 5-cleft; the lobes more or less clothed outside with a pale, very closely adpressed felt, spreading or reflexed in flower, glabrous or nearly so inside, ¼ in. long, ovate, obtuse contorted in the bud; throat naked, or nearly so; anthers exserted, linear; style exserted in consequence of the turning back of the corolla-lobes, clavate above, a little glandular; fruit globose, ½ to ⅝ inch in diameter, marked with the scar of the calyx-limb, 2-celled.

GOLUNGO ALTO.—A small tree, with dirty-white flowers. In the more elevated forests of Serra de Alto Queta, rather rare; fl. May 1855. No. **3093**. A bush of 6 to 8 ft., perhaps a young tree; flowers whitish. In the elevated forests of Sobato de Quilombo, Quiacatubia, sparingly and sporadic; young fr. and few fl. Feb. 1855. No. **3093***b*.

CAZENGO.—A bush as tall as a man; flowers white. Leaves at the time of the flower nearly always devoured by insects. In the more elevated forests of Serra de Muxâulo (Muschâulo); fl. and sparse fr. Jan. 1855. No. **3092**.

Seems near *R. micrantha* K. Schum.

2. **R. genipæflora** DC. Prodr. iv. p. 389 (1830); Hiern in Oliv. Fl. Trop. Afr. iii. p. 95.

Cf. *R. Quintasii* K. Schum. in Henr. Bol. Soc. Brot. x. p. 127 (1892).

ISLAND OF ST. THOMAS.—Mucumba, Dec. 1860. The specimen is without either fl. or fr., and therefore the determination is very doubtful. The leaves are ternate on the specimen, two being opposite and the third axillary, oval, papery, glabrous except small tufts of short hairs in the axils of the 6 pairs of slender veins on the lower face, 6 in. long by $2\frac{1}{2}$ in. broad; petiole $\frac{1}{4}$ in. long, slender; internodes about 3 in. long; branchlets sub-terete, glabrescent; stipules caducous, deltoid or lanceolate. No. **3097**.

3. **R. andongensis** Hiern, sp. n.

A tree, 10 to 25 ft. high; trunk ranging up to 18 in. in diameter, straight, erect; head ovoid or obovoid, evergreen; branches pallid, patent; branchlets sometimes reddish, glabrescent; leaves elliptical or somewhat obovate, cuspidate-acuminate at the apex, wedge-shaped or obtuse and unequal at the base, opposite or verticillate, 2 to 4 together, glabrous except the principal veins beneath, pallid on both faces, rather glossy above, coriaceous, often minutely punctate, 2 to $6\frac{1}{2}$ in. long by $\frac{5}{8}$ to $3\frac{1}{2}$ in. broad; lateral veins 4 to 6 on each side of the midrib, depressed on the upper face, raised often a little hairy and slightly reddish on the lower face; petiole $\frac{1}{8}$ to $\frac{1}{4}$ in. long, hairy or glabrate; stipules ovate or lanceolate, glabrate at the back, acute, entire, rather exceeding the petiole, deciduous; flowers whitish, silky-tomentose outside, $1\frac{1}{2}$ to 2 in. long before expansion, about 1 to $1\frac{1}{4}$ in. long when expanded, arranged several together in very abbreviated axillary bracteolate cymes; calyx $\frac{1}{4}$ to $\frac{1}{3}$ in. long; the limb cup-shaped, with 5 lanceolate acute rather unequal lobes about as long as the tube; corolla-tube slender, about an inch long, slightly widening upwards, glabrous inside; lobes lanceolate-oblong, contorted dextrorsely (as seen from above) in the bud, spreading in flower, glabrous inside, white or occasionally rosy; throat glabrous; anthers narrowly linear, glabrous, $\frac{3}{4}$ in. long, exserted, dorsifixed, inserted on very short slender filaments a little below the throat of the corolla and about one-third above the base of the anther; ovary 2-celled; style exserted, glabrescent, bidentate at the stigmatose apex; fruit globose-pyriform, puberulous, $\frac{2}{3}$ in. in diameter, crowned with the erect persistent calyx-limb; seeds few, about $\frac{5}{16}$ in. long, with rounded angles.

PUNGO ANDONGO.—In wooded situations between Catete and Luxillo,

within the præsidium; fl. April 1857. No. **3096**. In the shady wooded parts of Barranco de Songue; fl. and fr. end of May 1857. No. **3096***b*. In forests at the base of gigantic rocks near Luxillo, rather rare; young fr. Jan. 1857. No. **3096***c*.

4. **R. violascens** Hiern, sp. n.

A small tree, 6 to 9 ft. high, trunk $\frac{1}{5}$ to $\frac{1}{4}$ ft. in diameter; branches divaricate; branchlets tawny-tomentose, obtusely angular: leaves opposite or verticillate 3 together, elliptical, acutely cuspidate-acuminate at the apex, unequally wedge-shaped at the base, firmly membranous, with scattered pubescence on both faces, 3 to 5 in. long by $1\frac{1}{2}$ to $2\frac{1}{2}$ in. broad, flat, very narrowly revolute on the margin, deep-green above, paler-green beneath; lateral veins 7 to 10 on each side of the midrib, starting at about 45°; petiole about $\frac{1}{4}$ in. long, densely tawny-pubescent; stipules subulate-cuspidate from a broad ovate base, deciduous, rather exceeding the petiole; flowers axillary, solitary, subsessile, $2\frac{1}{4}$ to $2\frac{3}{4}$ in. long, pentamerous; calyx-limb about 1 in. long, pubescent outside, the tube about $\frac{1}{2}$ in. long, broadly subcylindrical, rather wider upwards; teeth 5, subulate from a short broad ovate base, about or nearly $\frac{1}{2}$ in. long, somewhat unequal, pubescent with tawny hairs; corolla salver-shaped, rather fleshy, 2 to $2\frac{1}{4}$ in. long when expanded, tomentose outside, whitish, slightly turning a violet colour, the lower half narrowly cylindrical, the upper funnel-shaped; lobes 5, ovate, acute, $\frac{3}{4}$ to 1 in. long, revolute, shortly tomentose on both faces, $\frac{1}{2}$ to $\frac{2}{3}$ in. broad at the base; anthers 5, linear, glabrous, exserted; filaments very short, glabrous, inserted at the throat of the corolla; style shortly exserted, glabrous, cleft near the apex.

Bumbo.—In the more elevated forests of Serra de Chella, at an elevation of 3500 to 4000 ft., sporadic and rather rare; fl. June 1860. No. **2580**.

5. **R. terniflora** Ficalho & Hiern. ms.

A bush or small tree, 3 to 8 ft. high, with the habit almost of a Magnolia; trunk $1\frac{1}{2}$ to 2 in. in diameter when the plant is 4 to 5 ft. high; branches lax, erect-spreading; branchlets thick, obtusely tetragonal, reddish, marked with large scars of fallen leaves, densely leafy and shortly tomentose at the tip, quickly glabrate; leaves opposite, obovate or elliptical, obtuse pointed or cuspidate at the apex, more or less narrowed at the base, glabrate, thickly coriaceous, very rigid, minutely squamulose-punctulate, subglaucous-green beneath, the adult ones deep-green above, 2 to 8 in. long by $\frac{3}{4}$ to $3\frac{1}{2}$ in. broad; lateral veins 7 to 9 on each side of the midrib in clear relief beneath; petioles short or very short, ranging up $\frac{1}{2}$ in.; stipules cuspidate from a short broad base, caducous; flowers campanulate-salver-shaped, 2 to $2\frac{1}{4}$ in. long, handsome, arranged in opposite abbreviated sessile terminal 3- to 1-flowered cymes, spreading or drooping; pedicels very short, shortly tomentose, bracteolate; bracteoles small, ovate, shortly tomentose; calyx (including the ovary) about $\frac{1}{2}$ in. long, the limb $\frac{1}{4}$ to $\frac{1}{3}$ in. long, cup-shaped, shortly tomentose on both faces,

shortly 5-cleft, the teeth about $\frac{1}{6}$ in. long, nearly equal, thickly cuspidate from a short broadly ovate base, persistent; corolla whitish (tawny in the dried state) and shortly felted outside, the tube pale-purple and glabrous inside, urceolate-funnel-shaped with a prolonged base, $\frac{1}{2}$ to $\frac{2}{3}$ in. in diameter, shortly 5-lobed; lobes rounded, $\frac{2}{5}$ to $\frac{1}{2}$ in. broad, $\frac{1}{3}$ to $\frac{2}{5}$ in. long, contorted dextrorsely (as seen from above) in the bud, spreading at the time of flowering, shortly tomentose outside, less densely hairy and glabrous about the base inside; throat glabrous; stamens included; anthers linear-oblong, $\frac{5}{8}$ in. long, glabrous; ovary 2-celled; style included, $1\frac{1}{2}$ in. long, club-shaped, glabrous; unripe fruit pendulous; globose, as large as a walnut, 1 to $1\frac{1}{4}$ in. in diameter, of a bright cinnamon colour outside, 1-celled, crowned with the hardened tubular and toothed calyx-limb; seeds embedded in pulp, somewhat compressed, with rounded angles.

Pungo Andongo.—In Panda forests at the river Mangue and near Caghuy; young fl.-bud and unripe fr. Jan. 1857. No. **2581***b*.

Huilla.—In the more open woods and thickets between Lopollo and Quipungo, sporadic; fl. and unripe fr. April 1860. No. **2581**.

In Engl. Bot. Jahrb. xxiii. p. 437 (1897), K. Schumann suggests the identity of our No. 2581 with his *R. Engleriana* described on his previous page and figured on p. 70 of Engl. & Prantl, Nat. Pflanzenfam. iv. (4) (1891); our plant has, however, rounded corolla-lobes and otherwise differs from his species. Our plant was also collected in Angola by Anchieta n. 25 in 1879, and by Capello n. 165. The following probably belongs to the same species :—

Huilla.—An evergreen shrub, 4 to 6 ft. high; leaves coriaceous, glossy; flowers white-reddish, $2\frac{1}{2}$ in. long, handsome, very sweetly fragrant, nodding, like a *Bignonia* in shape; fruit 1-celled; seeds numerous, enveloped in a sweet pulp, which is flavoured like that of the fruit of *Ceratonia Siliqua* L. and is consumed with great avidity by the negroes. In open forests between Huilla and Caconda, rather rare; fr. Jan. 1860. Coll. Carp. 5.

6. **R. maculata** DC. Prodr. iv. p. 388 (1830); Hiern, *l.c.*, p. 96.

Golungo Alto.—Calyx spathaceous according to Welwitsch (though the specimens before me do not confirm this description), 5-toothed; corolla dextrorsely contorted (as regarded from above) in æstivation, slightly ventricose in the middle in the bud; stamens 5, inserted below the throat of the corolla, without filaments; anthers yellow, adnate for two-thirds of their length to the corolla-tube on an elliptical tract; style columnar, twisted towards the upper part; stigma not seen (fully developed) with 5 short green dextrosely twisted foliaceous segments. In the forests of Capopa; foliage, beginning of August; fl.-buds end of Sept. 1855. No. **3095**. A very elegant little tree, 7 to 10 feet high; branches erect-spreading; leaves dry-coriaceous, very glossy; flowers white, sweetly fragrant, rather nodding; disk elevated, yellowish, 5-lobed; fruit (not quite ripe) ovoid-fusiform, crowned with the calyx-limb, unequal at the base, bright yellowish-green outside, slightly furrowed, the furrows deep at the base. In remarkably shady primitive forests near the spring of Capopa; fl. beginning of Nov. 1855. No. **3094**. Capopa; fl. beginning of June. No. **3094***b*. A small tree, 10 to 15 feet high; branches patent; branchlets herbaceous-green, cylindrical; leaves opposite or oftener

ternate, coriaceous, varnished-glossy on both faces, paler beneath, subrevolute on the margin, broadly undulate; flowers not then seen; July 1855. No. **3094***c*.

7. **R. macrantha** DC. Prodr. iv. p. 388 (1830); Hiern, *l.c.*, p. 97.

Golungo Alto.—A small tree of 8 to 12 feet, patently branched; branchlets curved-ascending; leaves crowded at the extremities of the branchlets, membranous, tender, the younger ones reddish or violet-purple; calyx-tube covering the ovary, cylindric-turbinate, green; the limb 5-partite, marked at the bottom of the segments with 10 scars; disk moderately elevated. In the more elevated very dense forests of Mata de Quisucula, rather rare; young fr. 28 April 1856. No. **3105**.

19. **GARDENIA** Ellis, L.; Benth. & Hook. f. Gen. Pl. ii. p. 89. *Decameria* Welw. Apont. p. 579, note 12.

1. **G. Jovis-tonantis** Hiern in Oliv. Fl. Trop. Afr. iii. p. 101; Ficalho, Pl. Uteis, p. 198 (1884).

Decameria Jovis-tonantis Welw. Apont. p. 579, Nota 12, and Synopse Explic. p. 10, n. 20, and p. 18, n. 44.

Golungo Alto.—A small evergreen tree, 5 to 8 feet high, nearly always in flower, very rigid in all its parts; branches branchlets and leaves ternate, patent; wood very hard; flowers large, in habit like those of *Tabernæmontana*, deep yellow, 2½ to 3 in. long, succulent; calyx-lobes 10, rarely 9; corolla salver-shaped; its lobes 10, rarely 9, contorted in imbrication; stamens 10, inserted on the corolla-throat; stigma very thick, oblong-claviform, consisting of 10 very viscid little lobes densely clustered; fruit as large as a good-sized goose's egg, ovoid-oblong, crowned with the 10 or 9 lobes of the persistent calyx-limb, hard, woody, grey-green; sarcocarp thick, woody, fibrous; endocarp almost bony, divided inside by 9 or 10 repla; seeds numerous, bony, angular-flattened, embedded in pulp. In dry hilly places among the mountains of Serra de Alto Queta, sporadic but not uncommon; fl. and fr. Dec. 1854. The natives call the tree "N-dai" or "Undai," and also "Dai"; and they fix branches of it on the roofs of their huts, as a protection against damage by lightning. On this account Welwitsch in naming it dedicated the tree to Jupiter. Also at Catomba, near the river Luinha; fl. July 1856. No. **2573**. Also at Cambondo; fr. Dec. 1856. Coll. Carp. 168 (partly).

Bumbo.—In rocky mountainous places among tall bushes, above Bumbo, at the base of the mountains of Serra de Chella, very sporadic; fl. Oct. 1859. No. **2579**.

Huilla.—A small tree, 6 to 15 ft. high, evergreen, its trunk rarely more than 8 in. in diameter; wood like that of *Buxus*; branches, branchlets and leaves ternate-verticillate; flowers yellow, large, salver-shaped; fruit the size of a hen's egg, green, afterwards covered with bark, many-seeded. Between Huilla and Quilengues; seeds Feb. 1860. Coll. Carp. 168 (partly).

According to a note of Welwitsch the Unday is also known by the local names of "Mŭlabi," "Morala," and "Saie." Fungus n. 440, *Hymenochæte rubiginosa* Lév., grew on decayed wood of this tree at Carengue in Golungo Alto in July 1857. The wood approaches a yellow colour, has a very fine grain, is very compact, heavy and remarkably strong, and is suitable for use in European workshops for all purposes for which box-wood is employed; the best time for felling the timber is in the months of June and July. The tree is remarkable by reason

of its flowers being completely 10-parted, and on this account Welwitsch regarded it as the type of a new genus allied to *Gardenia* : the decamerous structure of the flowers applies not only to the parts of the calyx and corolla and to the number of stamens, but it extends equally to the stigma, and the ovary usually shows ten divisions, though in some flowers the number of cells varies from 8 to 11 ; in ripening the germen permits the walls of the cells to be absorbed, thus becoming unilocular in fruit.

2. **G. tigrina** Welw. ms. in Herb.

A small tree, 15 to 20 ft. high in the primitive forests or 8 to 12 ft. in secondary woods ; woods hard ; head broad, leafy ; branches slender, glabrate, sub-terete, dark-green, spreading horizontally ; branchlets usually dichotomous, spreading irregularly, thinly pubescent or nearly glabrous, somewhat angular, leafy ; buds pubescent ; leaves opposite or ternate, elliptical, more or less acuminate at the apex, wedge-shaped or unequally obtuse at the base, thinly coriaceous, almost membranous, but little glossy above, glabrate or scattered with short adpressed pallid hairs, obscurely green or deep-green above, rather paler beneath with yellowish nerves, 3 to 6 in. long by 1 to 2¼ in. wide ; lateral veins 4 to 7 on each side of the midrib, slender ; petiole ⅛ to ¼ in. long ; stipules cuspidate, equalling or rather shorter than the petiole, deciduous ; flowers erect, like those of *Huernia* in shape colour and sub-cadaverous odour (this odour being especially strong shortly after the perfection of the flower), about 3 in. long when expanded, about 4 in. long just before the spreading of the corolla, axillary and subterminal, solitary, very shortly pedunculate, bracteate ; bracts small, like the stipules ; calyx pubescent outside, turbinate at the inferior base, the limb superior, tubular-cylindrical-cupshaped, ½ in. long, lined with long dense adpressed hairs inside, unequally 2- or 3-cleft at the apex, tipped with 4 or 5 elongated unequal pubescent subulate teeth ranging up to ⅝ in. long ; corolla of a pale-sulphur colour, spotted with red outside and more densely so inside, very handsome, badly scented, shortly hairy outside, elongate-funnel-shaped, narrowly sub-cylindrical and hairy inside in the lower half of the tube, funnel-shaped and glabrous inside in the upper half ; limb 5-partite, spreading or reflexed, about an inch long ; segments ovate, acuminate, acute, closely and shortly hairy on both faces except near the base inside, sinistrorsely contorted (as seen from above) in the bud ; anthers 5, about ¾ in. long, linear, glabrous, half exserted, inserted on very short filaments a little below the glabrous throat of the corolla, dorsifixed at a point one-third above the base ; style rather exceeding 3 in. long, exserted, glabrous or nearly so, subclavate and lobed or lined at the apex ; ovary unilocular ; fr. (not ripe) as large as a pigeon's egg, or even as a good-sized hen's egg, ellipsoidal, more or less 6- or 7-ribbed, skin green, here and there covered with coriaceous-crustaceous points, filled with a beautifully orange-coloured pulp, which surrounds the seeds, is highly astringent and stains the fingers dull blue.

Golungo Alto.—In the primitive forests of Quibanga, rather rare; fl. beginning of July 1856. No. **3098**. In the more elevated dense primitive forests of Mussengue, rare; fr. not yet ripe, middle of Dec. 1855. No. **3099**.

Cazengo.—In the elevated primitive forests of Machahula (Muxatûlo), at 2000 to 2500 ft. alt., sporadic in company with *Coffea arabica* L.; unripe fr. Jan. 1855. No. **3100**.

Nearly related to *G. urcelliformis* Hiern, of which the corolla is unknown; the calyx, however, somewhat differs.

20. **MACROSPHYRA** Hook. f. in Benth. & Hook. f. Gen. ii. p. 86.

1. **M. brachystylis** Hiern, sp. n.

A stout scabrid shrub, or occasionally a small tree 5 to 8 ft. high with a slender trunk and spreading branches, the upper branches showing a scandent tendency, elongated, sarmentose; both the leafy and the flowering branchlets developed from very viscid coriaceous-scalelike imbricate buds; leaves opposite, crowded at the extremities of the branchlets, more or less oval, shortly pointed at the apex, usually obtuse at the unequal base, membranous but juicy, rough to the touch on both faces, dull-green above, rather paler or browner beneath, 3 to 9 in. long by $1\frac{1}{4}$ to 6 in. broad; lateral veins spreading, 9 to 12 on each side of the midrib, rather slender; petiole long, ranging up to 3 in., scabrid; stipules ovate, entire: flowers $1\frac{3}{4}$ to $2\frac{1}{2}$ in. long, handsome, resembling those of a *Bignonia*, fasciculate on short peduncles at the tips of the branchlets; calyx-limb rather fleshy or membranous, campanulate, 5-cleft, glabrous below; lobes ovate or lanceolate, sub-equal, ciliolate; corolla $\frac{1}{4}$ to 2 in. long, funnel-shaped, fleshy, thickly coriaceous, fragile, sordid-purple or inside from orange to blood-red and striate-spotted, 5-fid, glabrous or nearly so; lobes oval, rounded at the apex, recurved or spreading; anthers 5, linear, included, $\frac{1}{3}$ in. long, inserted a little below the throat of the corolla, sessile or subsessile, glabrous; style glabrous or nearly so, 1 in. long, included, terminating in the subglobose bilobed stigma, $\frac{1}{4}$ in. in diameter; ovary 1-celled; fruit ellipsoidal-oblong, glabrous, 3 in. long, $1\frac{1}{4}$ in. in diameter, 1-celled, crowned with the remains of the calyx-limb; seeds numerous, embedded in adhesive pulp; pericarp thin, coriaceous; placentas apparently 4.

Golungo Alto.—In dense forests near N-delle; abortive fl. Feb. 1856. No. **3101**. In secondary woods by the river Delamboa; few fl. Dec. 1854. The same little tree was subsequently visited at various times and seasons, but not again found in flower. No. **3102**.

Ambaca.—In thickets near streams between Izanga and N-gombe, rather rare; fl. Oct. 1856. No. **3104**.

Pungo Andongo.—By rocky thickets within the præsidium, rather rare; fr. Oct. 1856. No **3103**.

The inclusion of this species enlarges the generic character in consequence of the short style; the stigma, however, in shape agrees with *Macrosphyra* rather than its next ally *Gardenia*. The two following Nos., not represented by flowers or fruits, perhaps belong to this species:—

GOLUNGO ALTO.—A scandent widely spreading shrub, with soft (but rough to the touch) membranous deep-green leaves. In forests at the banks of the river Quiapoze, 21 March 1856. No. **4749**.

PUNGO ANDONGO.—A strong shrub; trunk 1 to 2 in. thick, 4 to 6 ft. high; branches sarmentose, scandent; leaves membranous; flowers resembling those of a *Bignonia*, black-purple, yellow-lined or spotted inside; fruit elongated, 3 in. long, 1½ or 1 in. thick, apparently 1-celled, many-seeded, seen only in a half putrid condition. In the wooded parts of Barranco de Pedra Songue, within the præsidium; foliage, Dec. 1856 (fl. June 1857). In the forests of GOLUNGO ALTO the same species was seen as forming an erect tree of 8 ft. No. **4748**.

21. **CHALAZOCARPUS** Hiern, gen. nov.

Calyx-tube adnate to the ovary, more or less pyriform in fruit; limb deciduous; disk cushion-shaped, glabrous; fruit obovoid-oblong or pyriform, very densely tomentose-hirsute with pallid rigid hairs, papillose with numerous small elevations of the skin intermixed with very numerous minute elevations, 4- to 5-celled, indehiscent; cells with indefinite seeds; seeds numerous, attached to a central columnar placenta, angular, each enclosed in a thin loose often incomplete arilloid coat; angles of the seeds rounded; testa coriaceous; albumen horny, uniform; embryo slightly curved, of moderate size; cotyledons foliaceous, flattened.

A small weak slender tree, with large opposite herbaceous leaves, ovate entire caudate deciduous interpetiolar stipules, axillary inflorescence, and lateral and subterminal fruits solitary or on geminate peduncles in the axils of fallen leaves.

1. **C. hirsuta.**

A tree, 12 to 15 ft. high, slender, weak, almost herbaceous, erect hispid-hirsute on the young part lower face of leaves along the veins and fruit; branches opposite, lax, angular towards the extremities, pale or ashy, glabrescent; terminal buds tumid, pilose; leaves opposite, crowded at the extremities of the branches, ovate or sometimes obovate, shortly acuminate at the apex, unequal-sided and shortly decurrent-attenuate at the base, herbaceous, pale-green on both faces, especially beneath, scattered with short adpressed strigose hairs above, shortly hispid-hirsute along the veins and veinlets beneath, 12 to 18 in. long by 6 to 12 in. broad; lateral veins 9 to 12 on each side of the midrib, slender except near the midrib, in relief on the lower face; petioles 1 to 1½ in. long, channelled and hirsute above, rounded and glabrescent below; stipules ovate, caudate or subulate-apiculate, hirsute with pale rigid hairs, deciduous, densely hairy inside, ¾ to 1 in. long; flowers not seen; fruits on the stem after the fall of the leaves in the axils of their scars and sub-terminal, ovoid oblong or pyriform, more or less tomentose-hirsute with pale rigid hairs, under the hairs papillose with numerous small tubercles intermixed with very numerous minute ones, indehiscent, pallid, 1½ to 2 in. long, 1 to 1¼ in. in transverse diameter, 4-celled; interior scented almost like the fruit of *Ceratonia Siliqua* L.; seeds numerous, about ⅕ in. long by ⅙ in. thick, pallid, invested in a thin loose coat of the same colour.

CAZENGO.—In very dense forests among the higher mountains of Serra de Muxaula, sporadic and rare; fr. not yet fully ripe June 1855. No. **2574**.

The following two Nos. possibly belong to this species or genus:—

GOLUNGO ALTO.—A bush of 2 ft., perhaps a mutilated tree. In thickets springing up after tillage, near Zengas de Queta; without either fl. or fr. June 1856. No. **4746**.

PUNGO ANDONGO.—An arborescent shrub; stem straight, 1 to 2 in. thick; branches spreading; leaves opposite, large; stipules interpetiolar, pilose with long strigose hairs. Buds tumid, pilose. At the borders of forests, by the side of the gigantic rocks of the fortress; without either fl. or fr. March 1857. No. **4747**.

22. **OXYANTHUS** DC.; Benth. & Hook. f. Gen. Pl. ii. p. 91.

1. **O. tubiflorus** DC. Prodr. iv. p. 376 (1830); Hiern in Oliv. Fl. Trop. Afr. iii. p. 107.

PUNGO ANDONGO.—Leafy branchlets only; April 1857. The absence of flowers and fruits renders absolute identification difficult, but the foliage agrees with this species. No. **4751**.

2. **O. rubriflorus** Hiern, *l.c.*, p. 108.

GOLUNGO ALTO.—A small tree of 10 to 12 ft. high with a tortuous trunk, or in secondary thickets a shrub: flowers from yellow to red and variegated with green. In the dense forests among the mountains of Cabanga Cacalungo; fl. August 1856 and July 1855. Fruit egg-shaped subturbinate at the base or rarely subglobose, 2-celled, about an inch long; seeds numerous, about $\frac{1}{3}$ in. long. Nos. **3087**, **3087***b*. A shrub, almost a small tree, 5 to 8 ft. high; stem branches and leaves remarkable for their green-glaucous hue; leaves coriaceous, wedge-shaped or obtuse at the base, shining on the upper face, quickly drying; fruit olive-shaped or somewhat pear-shaped, turbinate at the base, green, many-seeded, smooth outside, $1\frac{1}{2}$ to 1 in. long. Habit Acanthaceous. In elevated shady forests by streams among the mountains of Serra de Alto Queta; fr. August 1855. Apparently this species. No. **3088**.

3. **O. speciosus** DC. in Ann. Mus. Par. ix. p. 218 (1807); Hiern, *l.c.*

ISLAND OF ST. THOMAS.—A small tree, but perhaps a young one. Fr. Dec. 1860. Native name "Mule-Mule." No. **3090**.

The following two Nos., without notes in the collection, must be compared with this species, and the second No. also with the previous species:—

GOLUNGO ALTO.—Fl.-bud. No. **3089**. Without fl. or fr. No. **3088***b*.

3. **O. pallidus** Hiern, sp. n.

A glabrous little tree, 8 to 10 ft. high; trunk 6 in. in diameter at the base; branches pallid, dichotomous, obtusely angular, rather slender, green and somewhat flattened at the extremities; leaves oval or elliptic-oblong, more or less cuspidate-acuminate at the apex, in most cases obtusely and unequally narrowed and narrowly decurrent at the base, thinly coriaceous, deep-green or glaucescent-green above, pallid beneath, 4 to $6\frac{1}{2}$ in. long by 1 to $2\frac{2}{3}$ in. broad; margin very narrowly revolute; lateral veins 6 to 9

on each side of the midrib, slender; petiole $\frac{1}{4}$ to $\frac{2}{5}$ in. long; stipules ovate or lanceolate, acute, entire, connate at the base, $\frac{1}{2}$ to $\frac{3}{4}$ in. long, pallid, persistent; flowers very slender, 4 to 5 in. long, whitish, several together in comparatively short axillary cymes; pedicels $\frac{1}{8}$ to $\frac{3}{8}$ in. long; bracts like the stipules but much smaller, deciduous; bracteoles subulate; calyx-limb small, shortly cup-shaped with 5 lanceolate or subulate lobes $\frac{1}{10}$ to $\frac{1}{8}$ in. long; corolla-lobes 5, linear-oblong, $\frac{2}{3}$ to 1 in. long, spreading; anthers 5, exserted, $\frac{1}{10}$ in. long; ovary 1-celled; style exceeding the corolla-tube by $\frac{3}{5}$ to $\frac{5}{6}$ in., narrowly clavate at the apex; fruit subglobose, somewhat pyriform, scarcely an inch long, about $\frac{2}{3}$ in. in transverse diameter, 1-celled; seeds rather numerous, about $\frac{1}{8}$ in. long.

Golungo Alto.—Queta: fr. July 1855. No. **2582***b*.

Pungo Andongo.—In the wooded parts of Barranco de Songue, rather rare; fl. Dec. 1856. No. **2582**.

23. **SHERBOURNIA** G. Don in Loud. Encycl. Pl., Suppl. ii., p. 1323 (1855).

Amaralia Welw. ex Benth. & Hook. f. Gen. Pl. ii. p. 90.

1. **S. foliosa** G. Don in Loud. Encycl. Pl., Suppl. ii., p. 1322 (1855).

Gardenia bignoniæflora Welw. Apont. p. 585, n. 13 (1859). *Amaralia bignoniæflora* Welw. ex Hiern in Oliv. Fl. Trop. Afr. iii. p. 112.

Golungo Alto.—A robust shrub, climbing to a great height: branches purple; leaves evergreen, coriaceous, faintly green above, pale-green beneath, narrowed or occasionally cordate at the base: flowers handsome, 2 inches long, fleshy-coriaceous, almost like those of a *Bignonia* in shape, hoary outside when dry, solitary, axillary, somewhat nodding; peduncle short; calyx foliaceous, lax, purplish; corolla rose-violet, purple inside, silky-shining outside, turning ashy in drying, the tube cylindrical at the base, widening shortly above the base, almost an inch in diameter, the limb 5-lobed, lobes broad, rounded-obtuse, spreading and then turned back; stamens 5; fruit (not quite ripe) ovoid-oblong, green, crowned with the persistent calyx-limb: cells many-seeded. In the dense primitive forests of Serra de Alto Queta, sporadic; fl. and young fr. Dec. 1854. No. **2571**.

Pungo Andongo.—A shrub or small tree with elongated, subsarmentose branches, and broad opposite leaves; flowers rather large, orange-coloured variegated with dark purple; corolla thickly coriaceous. In bushy wooded parts of the district; seeds, 1856 and 1857. Coll. Carp. 642.

According to Welwitsch, Apont., *l.c.*, the fruit is 1-celled, elongate-ellipsoidal, 1 to $1\frac{1}{2}$ in. in diameter, 3 to $3\frac{1}{2}$ in. long.

24. **POUCHETIA** A. Rich.; Benth. & Hook. f. Gen. Pl. ii. p. 92.

1. **P. africana** DC. Prodr. iv. p. 393 (1830); Hiern in Oliv. Fl. Trop. Afr. iii. p. 117.

Prince's Island.—In bushy places along a stream by the lower slopes of Pico de Papagaio; fr. Sept. 1853. No. **1251**.

25. **TRICALYSIA** A. Rich.; Benth. & Hook. f. Gen. Pl. ii. p. 95. *Kraussia* Harv.; Benth. & Hook. f., *l.c.*, p. 95. *Diplocrater* Hook. f.; Benth. & Hook. f., *l.c.*, p. 96.

1. **T. cacondensis** Hiern, sp. n.

A dwarf much-branched tree or shrub, from about 6 in. high upwards; branches glabrescent, pallid or ashy, sub-terete; branchlets somewhat quadrangular, puberulous at the extremities, leafy; leaves narrowly elliptical obovate or oblanceolate, obtusely narrowed, rounded or scarcely apiculate at the apex, yellowish-green, wedge-shaped at the subsessile base, rigidly coriaceous, glabrescent, 1 to 3 in. long by $\frac{1}{4}$ to 1 in. broad; margin narrowly revolute; lateral veins 6 to 8 on each side of the midrib, not conspicuous, reticulate; stipules from a short broad connate base subulate-acuminate, $\frac{1}{8}$ to $\frac{1}{4}$ in. long, puberulous at first, glabrescent; flowers nearly $\frac{1}{2}$ in. long before expansion, about $\frac{1}{3}$ in. long when expanded, subsessile, several together in opposite much abbreviated axillary little cymes, bracteolate, pentamerous; bracteoles broad or calyculate, rounded-apiculate or truncate, puberulous, ciliolate, falling short of the calyx; calyx (including the ovary), $\frac{1}{8}$ in. long, green, the limb $\frac{1}{16}$ in. long, deeply divided; segments ovate, rounded at the apex, glabrous everywhere except the ciliolate margins; corolla white, glabrous outside, the tube $\frac{3}{16}$ in. long, tubular funnel-shaped, pilose inside on the upper half up to the throat; lobes $\frac{3}{16}$ in. long, glabrous on both sides except inside near the base, ciliolate about the apex, oval, rounded at the apex, contorted dextrorsely (as seen from above) in æstivation, spreading in full flower; anthers 5, glabrous, exserted, dorsifixed, lanceolate-linear, appendaged at the apex, $\frac{1}{8}$ in. long; filaments glabrous, flattened, $\frac{1}{16}$ in. long, inserted just below the base of the corolla-lobes and alternating with them; disk annular-cupular, fleshy; ovary glabrous, campanulate, somewhat compressed, narrower than the calyx-limb, 2-celled; style $\frac{5}{16}$ in. long, glabrous, cleft at the apex; ovules 2, collateral in each cell; placentas fleshy; fruit red, subglobose or ellipsoidal, $\frac{1}{4}$ to $\frac{1}{3}$ in. long, glabrous, somewhat ribbed vertically, 2-celled, tipped with the persistent calyx-limb, bracteolate at the base.

Huilla.—A dwarf tree; anthers with a long subulate apiculus. By the road to Quipaca, past the fortress near Ferrão; fl. Oct. 1859. No. **3112**. In bushy pastures on the right bank of the river of Lopollo, among shrubby Mimosas; young fr. Dec. 1859. No. **3113**. In thickets on the right bank of the river of Lopollo; fr. end of March 1860. The specimens afford evidence of the fruiting branches being shoots sprung up from the burnt stems of a previous season. No. **3114**.

The same species was collected at Caconda in Nov. 1877 in fl. by Anchieta, n. 109, and at the same place in Jan. 1878 in fr. by Capello and Ivens, n. 16; it is there called by the natives "Onjamba" or "Ojamba."

2. **T. buxifolia** Hiern in Oliv. Fl. Trop. Afr. iii. p. 119.

Loanda.—A shrub with the habit of the genus; flowers white, strictly pentamerous; calyx-limb rather loose, with obtuse lobes;

corolla-throat densely bearded ; anthers exserted ; connective produced at the apex with a subulate appendage ; style level with the anthers ; stigma deeply bilobed. Gabriel's coffee tree. No. **3118**. An evergreen shrub, 3 to 5 ft. high ; branches straight, spreading, decussate, with a whitish bark ; leaves rigidly coriaceous, shining, paler beneath ; flowers white, fragrant ; corolla contorted in æstivation. In hilly bushy rocky places at the back of Alto das Cruzes ; fl. Feb. 1854 ; unripe fr. April 1854. No. **3119**. A shrub of 5 to 7 ft., evergreen, forming the densest thickets ; branches decussate, whitish ; stipules acuminate ; leaves coriaceous, rather glossy, from pale yellowish to greenish and paler beneath ; fruit as large as a small pea or a peppercorn, greenish purple when unripe, crowned with the remains of the calyx-limb. In hilly, sandy and rocky places, not far from Quicuxe, abundant ; unripe fr. May 1854. No. **3120**. A shrub ; stems cæspitose, erect, 4 to 6 ft. high, patently branched ; leaves evergreen ; berries clustered, as large as a small pea, at first green, soon turning to bluish-green, at length black, 2-celled ; seeds 2 or 3 or rarely 4 in each cell, or very rarely solitary in one of the cells. On bushy plains near Quicuxe ; fr. 7 Feb. 1859. No. **3121**. A shrub, 4 to 5 feet high ; branches whitish ; leaves evergreen ; fruit baccate, black, pruinose. In thickets between Quicuxe and Mutollo, sporadic ; seeds July 1854. Probably this species. Coll. Carp. 134.

3. **T. glabra** K. Schum. in Engl. Bot. Jahrb. xxiii. p. 445 (1896).

Pungo Andongo.—A tree, 12 to 15 ft. high ; trunk 6 in. in diameter at the base, unbranched to the height of 5 ft., then with spreading branches and nodding branchlets ; flowers white ; corolla densely bearded at the throat ; anthers produced at the apex of the connective into an apiculus ; style filiform, gradually thickened upwards, obsoletely bilobed, the lobes stigmatose. In deep, shaded, wooded valleys amongst the gigantic rocks of the præsidium at Catete, sporadic ; fl. Nov. 1856. No. **3117**.

The above No. is the type of the species ; the two following Nos. appear also to belong to the species :—

Pungo Andongo.—A graceful and ornamental tree, 6 to 8 ft. high, much branched ; branches spreading ; leaves coriaceous, shining, very bright green ; unripe fruit green, 3- or 2-celled, crowned with the calyx-limb, bracteate at the base. In elevated rocky parts of the præsidium, in Pedra de Cabondo ; young fr. end of April 1857. No. **3091**. A tree of $5\frac{1}{2}$ ft., with the habit of the genus or of a tangerine orange tree ; head sparse ; leaves bright-green, persistent, pallid beneath ; unripe fruit greenish. Near the top of Pedra de Cabondo in rocky situations within the præsidium ; only one branch seen in fr. April 1857. No. **3129**.

4. **T. andongensis** Hiern, sp. n.

A robust shrub, with the habit of a *Coffea* ; branches divaricate, sub-terete, glabrate, dark-ashy ; branchlets scandent or pendulous-nodding, often alternate, leafy and densely beset towards the extremities with whitish rigid short hairs, somewhat angular ; leaves elliptical, more or less narrowed at each end, firmly papery, glabrous except the principal veins and ciliolate margin, green above, rather paler beneath, flat, $2\frac{1}{2}$ to 4 in. long by $1\frac{1}{4}$ to $1\frac{3}{4}$ in. broad ; lateral veins 4 or 5 on each side of the midrib, slender ; petiole hairy, $\frac{1}{3}$ to $\frac{3}{8}$ in. long ; stipules entire, ovate,

connate at the base, subulate at the apex, hairy on the back, $\frac{1}{8}$ to $\frac{1}{6}$ in. long; fruit green, globular, indehiscent, drupaceous, $\frac{1}{3}$ to $\frac{3}{8}$ in. in diameter, minutely speckled, glabrate or scattered with whitish short rigid hairs, densely hairy about the apex, crowned at the apex with the remains of the calyx-limb, axillary or lateral on the branchlets, solitary or nearly so, sessile or subsessile, bracteolate at the base; fruiting calyx-limb apparently 5-partite, the segments lanceolate, pilose at the back, glabrous inside, in some cases $\frac{1}{4}$ in. long and erect; bracteoles broadly ovate, hairy on both faces, short, involucrate; fruit-cells 2, each containing 2 seeds, or by abortion 1 only in one of the cells; seeds pendulous from the apex of the centre of the cell, about $\frac{1}{4}$ in. long.

Pungo Andongo.—On the Calemba islands in the river Cuanza; fr. 12 March 1857. No. **3133**.

5. **T. Welwitschii** K. Schum., *l.c.*, p. 449 (1897).

Golungo Alto.—A shrub, 8 to 10 ft. high, evergreen; calyx green, 5-cleft; corolla whitish, the lobes purplish at the base, the tube beset in all parts with rigid whitish hairs directed upwards; berries as large as a small pea, 2-celled, green, in old age reddish, the cells 6-seeded. At the borders of forests near Ponte do Felix Simões; fl. April 1855. No. **3106**. A shrub as tall as a man; branches opposite, decussate, spreading horizontally; corolla tubular, white, the limb 5-cleft, the lobes ovate-cuspidate, livid-violet on the margin, elsewhere white like the tube; throat densely shaggy with rigid-white hairs. On the left bank of the river Quiapoze, in very dense forests, sparingly; fl. 17 March 1856. No. **3107**. Bango road; fl. Jan. 1856. No. **3108**. In bushy places near Ponte do Felix Simões, not abundant; fr. Oct. 1855. No. **3109**. An evergreen shrub, but the habit very like that of a *Cremaspora*. At an elevation of about 3000 ft. Coll. Carp. 649.

6. **T. griseiflora** K. Schum., *l.c.*, p. 446 (1896).

Golungo Alto.—On wooded hills by the river Coango; fl. 12 May 1856. No. **3131**. In thickets at the skirts of forests about Sange, by Senhor Mariano's planted field (arimo); fr. August 1856. No. **3132**. Corolla always dirty-white. In the denser forests throughout the district, flowering and fruiting nearly all the year. No. **3164**. A very elegant tree, 6 to 8 ft. high, resembling in habit a tangerine orange tree; head pyramidal; leaves coriaceous, glossy. By wooded thickets near Ponte do Felix Simões; without either fl. or fr. 2 Jan. 1855. Determination doubtful. No. **3130**. A bush 5 to 9 ft. high, with coriaceous leaves and red berries. Mussengue; seeds Dec. 1855. Determination also doubtful. Coll. Carp. 660.

A specimen in flower-bud from the banks of the Luinha river in Golungo Alto, found by Dr. Livingstone in Dec. 1854, and reported by him to be there cultivated as coffee, exists without No. in Herb. Welwitsch. It was mentioned in the Flora of Tropical Africa, iii. p. 123, under *T. niamniamensis* Schweinf.; perhaps it rather belongs to *T. griseiflora*.

Cazengo.—A shrub, 4 to 6 ft. high; branches almost sarmentose or loosely pendulous; branchlets spreading; fruit orange-scarlet, crowned with the whitish or greenish calyx-limb. By thickets along the base of the mountain Muxaûlo, rather rare; nearly ripe fr. Dec. 1854. No. **3128**.

PUNGO ANDONGO.—A graceful tree, 12 to 15 ft. high; branches erect-spreading; leaves coriaceous, glossy: stipules interpetiolar, with a broad base and long acumen at the apex; fruit bright scarlet, ovoid globose, but little fleshy, crowned at the apex with the hardened calyx-limb, based with the calyculus, 2-seeded: seeds ovate-orbicular, convex on one side, on the other slightly concave, the margin on one or both sides involute after the fashion of coffee seeds. In deep shady bushy valleys within the præsidium; sporadic; ripe fr. middle of Jan. 1857. No. **3125**. In bushy rather shady places at the sides of the gigantic rocks of the præsidium; fr. and fl.-bud Jan. 1857. No. **3125***b*. A tree 5 to 7 ft. high; trunk slender, erect; head pyramidal; branches spreading; bark of the trunk and branches whitish; leaves coriaceous; fruit scarlet, at the base of the gigantic rocks of the præsidium, on the western side; fl.-bud beginning of Jan. 1857. No. **3126**. A tree, 7 to 9 ft. high: trunk straight; head obtusely pyramidal: bark whitish; leaves thinly coriaceous, evergreen, rather glossy. At the bottom of the gigantic rocks of the præsidium, sporadic; young fruit beginning of Dec. 1856. No. **3127**.

7. **T. benguellensis** Welw. ms. in Herb.

An ornamental shrub, 2 to 6 ft. high, erect; branches and branchlets patent, decussate, leafy, glabrescent, towards the extremities reddish and puberulous; bark ashy; leaves oblanceolate or obovate-oblong, rounded or obtusely pointed at the apex, wedge-shaped at the base, glabrate or puberulous beneath, deep-green above, paler beneath, coriaceous, 1 to 2 in. long by $\frac{1}{4}$ to $\frac{4}{5}$ in. broad; margins sub-recurved; lateral veins few, inconspicuous, sometimes with tufts of short hairs in the angles where they start from the midrib; petiole very short or obsolete, often hairy; stipules entire from a short ovate or truncate connate base subulate, $\frac{1}{10}$ to $\frac{1}{8}$ in. long; flowers whitish, about $\frac{1}{4}$ in. long when expanded, clustered about three together in very abbreviated opposite axillary approximated cymes, subsessile, bracteolate at the base; bracteoles calyculate, beset with short rigid whitish hairs, falling short of the calyx; calyx small, campanulate, somewhat compressed, including the ovary $\frac{1}{10}$ in. long, persistent, the limb $\frac{1}{15}$ in. long, cupshaped, hairy on both faces, truncate, 6-toothed at the apex; corolla salver-shaped, the tube narrower than the calyx-limb, glabrous both inside and out, $\frac{1}{5}$ in. long; throat glabrous; limb 6-partite, the segments $\frac{1}{6}$ in. long, oblanceolate-oblong, rounded at the apex, not much narrowed towards the base, hairy outside, glabrous inside, spreading in full flower; stamens 6, exserted, glabrous; filaments lanceolate-linear, flattened, $\frac{1}{16}$ in. long, inserted at the base between the corolla-lobes; anthers linear, $\frac{1}{8}$ in. long, dorsifixed at the middle; disk fleshy, glabrous, short, annular-cup-shaped; style $\frac{1}{4}$ in. long, erect, straight, slender, glabrous, bifid about a quarter way down; ovary 2-celled; cells 2-ovuled; berry pea-shaped, $\frac{1}{5}$ to $\frac{1}{4}$ in. in diameter, scarlet, glabrous, crowned with the hairy urceolate calyx-limb, 2-seeded or rarely by abortion 1-seeded.

BUMBO.—A shrub with white flowers. In wooded parts of Serra da Xella; fl. with scarcely any leaves, Oct. 1859. Apparently this species. No. **3124**.

HUILLA.—In rocky thickets about Lopollo and in elevated places in Morro de Lopollo, at an altitude of 5000 to 5500 ft., everywhere; fl. Nov. 1859; nearly ripe fr. end of March 1860. No. **3122**. On declivities from Lopollo towards Humpata, sporadic; rather young fr. beginning of Feb. 1860. No. **3123**.

Nearly related to *T. djurensis* Schweinf., but differs by the wedge-shaped base of the leaves, etc.

26. **CREMASPORA** Benth.; Benth. & Hook. f. Gen. Pl. ii. p. 108.

1. **C. africana** Benth. in Hook. Niger Fl. p. 412 (1849); Hiern in Oliv. Fl. Trop. Afr. iii. p. 126.

PUNGO ANDONGO.—A slender climber shrub, with obovoid-ellipsoidal drupes. At the banks of the river Lombe; fr. 9 March 1857. No. **3110**.

27. **POLYSPHÆRIA** Hook. f.; Benth. & Hook. f. Gen. Pl. ii. p. 127.

1. **P. neriifolia** K. Schum. in Engl. Ost-Afrik. C., p. 383 (1895).

Var. **subnutans** Hiern.

A slender glabrous tree, 7 to 10 ft. high, with the habit of a *Coffea*; branches spreading; bark pallid; branchlets somewhat drooping, deep-green; leaves lanceolate-oblong, shortly or scarcely glossy, acuminate at the apex, obtuse or unequally narrowed at the base, thinly coriaceous, 4 to 7 in. long by 1 to $1\frac{5}{8}$ in. broad; lateral veins patent, slender, numerous, inconspicuous; margin often wavy; stipules supra-axillary, ovate, apiculate, deciduous; fruits (unripe) globose, green, $\frac{1}{3}$ in. in diameter, subsessile, clustered a few together in the upper axils, crowned at the apex with the shortly hairy remains of the quadridentate calyx-limb, bracteolate at the base; bracteoles small, stipuliform.

PUNGO ANDONGO.—In the shadiest parts of the Calemba Islands in the river Cuanza; young fr. 11 March 1857. No. **3111**.

28. **PENTANISIA** Harv.; Benth. & Hook. f. Gen. Pl. ii. p. 104.

1. **P. cærulea** Hiern, sp. n.

A perennial herb, glossy, glabrous, bright herbaceous-green, with the habit of a *Thymus*, scarcely a foot high; rootstock woody; stems numerous, erect, gradually more branched in the upper part, cylindrical at the base, flattened-angular or compressed above, yellowish-green, turning reddish in the dried state; leaves sub-linear or linear-oval, apiculate at the apex, narrowed towards the sessile or subsessile base, opposite, herbaceous, $\frac{3}{4}$ to $1\frac{1}{4}$ in. long by $\frac{1}{10}$ to $\frac{1}{4}$ in. broad, uninerved or with a few inconspicuous lateral veins; stipules from a short broad base adnate to the petiole or leaf-base with two or three lanceolate or subulate tips; flowers about $\frac{1}{2}$ in. long, sessile, in dense terminal very abbreviated sub-capitate cymes; calyx-limb 5-cleft, three of the teeth small subulate, the two others foliaceous much larger similar to the leaves; corolla salver-shaped, the tube very slender throughout, about $\frac{2}{3}$ in. long, violet-coloured; the limb 5-partite; segments spreading in full flower, valvate in the bud, about $\frac{1}{6}$ in.

long, oblong-lanceolate, rather obtuse, deep violet-blue; throat glabrous; stamens 5, exserted; filaments filiform, inserted at the throat; anthers linear-oblong; disk small, fleshy; ovary 2-celled; ovules solitary in each cell, attached near the apex, pendulous; style exserted, bifid, filiform, violet-coloured; fruit ovoid, dicoccous, about $\frac{1}{11}$ in. long; seed solitary in each cell, pendulous from near the apex some way down, soon free, minutely punctulate.

HUILLA.—In sparingly-herbaceous places, somewhat shady, in company with *Elephantopus*, in forests composed of species of *Protea* and Myrtaceæ, at the river Monino, along the road to Quilengues, abundant; fl. and sparing fr. Feb. 1860. No. **5314**.

29. **CANTHIUM** Lam. Encycl. Meth. i. p. 602 (1783).

Plectronia DC.; Benth. & Hook. f. Gen. Pl. ii. p. 110; non L.

Plectronia L. is essentially a different genus; the character originally drawn up and published by Linnæus positively negatives an agreement with *Canthium*, and the specimen in his herbarium subscribed by his own hand with the name *Plectronia ventosa* is an *Olinia*. It is true that he associated with his plant a plate of a shrub in fruit figured by Burman and now considered as a *Canthium*, but Linnæus had not seen the specimen, and gives the fruit-characters solely on the authority of Burman; these characters, however, are quite immaterial for the purpose of the discrimination of the genus. Furthermore, Linnæus in describing his only species had regard exclusively to his own specimen, and although he quotes Burman's plate, he entirely neglects it for the purpose of his definition.

1. **C. rhamnoides** Hiern, sp. n.

A bush, 8 ft. high, with the habit of a *Rhamnus*; branches spiny, sub-sarmentose, divaricate, pallid, glabrate, sub-terete: branchlets pubescent, somewhat compressed towards the extremities; spines $\frac{1}{4}$ to $\frac{1}{2}$ in. long; leaves opposite, elliptical or somewhat obovate, acuminate at the apex, unequally narrowed or obtuse at the base, papery-membranous, green and scattered with depressed hairs above, paler-green and pubescent with hairs scattered and more closely arranged along the nerves and veins beneath, $2\frac{1}{2}$ to 4 in. long by 1 to 2 in. broad; lateral veins 6 or 7 on each side of the midrib, starting at about 35° with it, slender; petiole $\frac{1}{6}$ to $\frac{1}{4}$ in. long, pubescent; stipules subulate-caudate from a broad base, pubescent, exceeding the petiole; flowers greenish, pentamerous, on pubescent pedicels of $\frac{1}{8}$ to $\frac{1}{4}$ in. long, several together in axillary opposite subsessile globular cymes of $\frac{1}{2}$ to $1\frac{1}{2}$ in. in diameter; calyx pubescent outside, the tube turbinate, small; the limb quinquepartite, the segments linear, $\frac{1}{12}$ to $\frac{1}{10}$ in. long, glabrous inside; disk fleshy, cushion-shaped, glabrate or obsoletely puberulous; ovary 2-celled, fleshy; ovules solitary, pendulous; young fruit subglabrate, obovoid or oblique, nearly $\frac{1}{2}$ in. long.

PUNGO ANDONGO.—In little woods by streams on the elevated rocks of Tunda Quilombo; after the fall of the corolla and in young fr. Jan. 1857. No. **5350**.

2. **C. virgatum** Hiern, sp. n.

A much branched erect virgate glossy shrub, 5 to 7 ft. high; branches subterete, glabrate, whitish; branchlets somewhat compressed and shortly hairy towards the extremities, glabrescent, patent, sometimes abbreviated and almost spiniform; leaves opposite, ovate or oval, obtusely narrowed or acuminate and subapiculate at the apex, obtuse rounded or subcordate at the base, coriaceous, rigid, glabrous, shining and with venation and reticulation in relief on both faces, deep-green above, paler-green beneath, 1 to 2 in. long by $\frac{1}{2}$ to 1 in. broad; lateral veins 3 or 4 on each side of the midrib, slender, not conspicuous; petiole very short; stipules from a very short broadly ovate or sub-truncate base subulate; flowers white, white-rosy in bud, greenish in young bud, fragrant, pentamerous, $\frac{1}{6}$ in. long before expansion, $\frac{1}{12}$ in. long when expanded, glabrous outside, on short glabrate pedicels arranged in abbreviated axillary cymes; calyx green; limb small, repand-quinquedentate, ciliolate; corolla deeply 5-cleft; segments ovate-oblong, obtuse, valvate in the bud, reflexed in full flower; tube short, pilose inside; throat bearded; stamens 5, inserted in the sinuses between the corolla-segments, glabrous, exserted; anthers lanceolate-oblong; disk glabrous; ovary turbinate-campanulate, very small, fleshy, 2-celled; style filiform, exserted, glabrous; stigma thick, mitriform, truncate and hollowed at the base, deeply bilobed at the apex; ovules solitary in the cells, pendulous.

LOANDA.—In dry hilly wooded situations among scattered bushes by roadside near Quicuxe in company with plants of *Strychnos*, and at Imbondeiro dos Lobos, not uncommon; fl. 25 March 1858, and fl.-bud May 1854 and 1859. No. **4752**.

3. **C. kraussioides** Hiern, sp. n.

A much branched, sarmentose, evergreen, glabrous, glossy shrub, 4 to 6 ft. high; branchlets spreading, quadrangular, opposite; leaves opposite, elliptical or lanceolate, often subacuminate, narrowed to an obtuse or apiculate apex, unequally wedge-shaped or obtuse at the base, coriaceous, glossy deep-green and slightly yellowish-green above, paler yellowish-green beneath, 2 to 3 in. long by $\frac{1}{2}$ to $1\frac{1}{4}$ in. broad; lateral veins 3 to 6 on each side of the midrib, inconspicuous; margins narrowly revolute; petioles $\frac{1}{6}$ to $\frac{1}{4}$ in. long; stipules from a broad ovate connate base subulate, about equalling the petiole; flowers white, pentamerous, $\frac{1}{5}$ to $\frac{1}{4}$ in. long when expanded exclusive of the glabrous exserted style, $\frac{2}{5}$ to $\frac{1}{2}$ in. long inclusive of it, numerous, on puberulous pedicels of $\frac{1}{5}$ to $\frac{1}{3}$ in. long, arranged in an umbellate or sub-umbellate manner in subsessile or very shortly pedunculate axillary opposite cymes $\frac{1}{2}$ to 1 in. in diameter; calyx campanulate, $\frac{1}{20}$ to $\frac{1}{10}$ in. long, glabrous outside or nearly so; limb short, quinquedentate; teeth small, lanceolate, minutely ciliolate; corolla-tube sub-glabrous outside, pilose inside, $\frac{1}{6}$ to $\frac{1}{5}$ in. long; throat bearded;

lobes $\frac{1}{5}$ to $\frac{1}{4}$ in. long, lanceolate, produced at the apex into a filiform puberulous tail, valvate in the bud, reflexed in full flower, somewhat pilose inside; stamens 5, exserted; filaments inserted at the throat, alternating with the corolla-lobes, compressed, minutely puberulous, $\frac{1}{12}$ in. long; anthers linear-oblong, yellowish, glabrous, $\frac{1}{12}$ in. long, 2-celled, dehiscing longitudinally; disk glabrous, fleshy, annular; ovary 2-celled, ovules solitary in the cells; style far exserted, glabrous, filiform; stigma calyptriform, subcylindrical, green-yellowish, cleft at the apex; berry (the only one seen) didymous, $1\frac{1}{4}$ in. in diameter, glabrous.

Huilla.—In elevated thickets in Morro de Humpata, at an elevation of 5200 ft.; fl. Feb. 1860. No. **5352**.

Nearly related to *C. caudatiflorum* Hiern.

4. **C. gracile** Hiern in Oliv. Fl. Trop. Afr. iii. p. 139.

Loanda.—Flowers herbaceous-green, somewhat resembling those of an *Aralia*; stigma calyptriform. In thickets in company with species of *Arduina*, occasional in the district: fl. and very young fr. Nov. 1853. No. **3137**, Near Museque de Luiz Gomez; after the fall of the corolla, March and April 1854. No. **3139**. A robust shrub, with patent branches numerous flowers and usually with didymous fruits. In thickets near Imbondeiro dos Lobos; fr. Feb. 1858. The albumen in the seeds is ruminated. The foliage resembles or approaches that of *C. congense* Hiern; the determination is doubtful. No. **3138**.

Zenza do Golungo.—A shrub with ascending branches, coriaceous leaves and whitish flowers. On craggy mountains near Quicanda; fl. Sept. 1856. This must also be compared with *C. congense*. No. **3141**.

5. **C. glabriflorum** Hiern, *l.c.*

Island of St. Thomas.—A tree of moderate size. In the more elevated primitive forests; fl. Dec. 1860. Called by the negroes "Clacla." No. **3147**.

K. Schumann in Engl. Pfl. Ost-Afr., C., p. 386, includes under this species *C. polycarpum* Schweinf., a plant from Niamniam-land, which, however, he cites as *C. polyanthum*.

6. **C. Medusula** Welw., sp. n.

A subscandent shrub, almost arborescent, or even a small tree; habit like that of a *Coffea*; branches opposite, long, patent-nodding or sarmentose, obtusely quadrangular, glabrate, towards the extremities somewhat compressed; leaves opposite, oval, cuspidate at the apex, rounded or nearly so at the base, thinly coriaceous, glossy, glabrescent except sometimes the midrib and principal veins beneath, ciliate when young, deep-green above, paler beneath, $2\frac{1}{2}$ to 4 in. long by $1\frac{1}{2}$ to $2\frac{1}{2}$ in. broad; lateral veins 5 to 7, clearly marked beneath each side of the midrib; petiole hispid-pubescent at least at first, on some of the branches bent so as to make the leaves unilateral, about $\frac{1}{4}$ in. long; stipules interpetiolar, broadly ovate, concave, apiculate, $\frac{1}{4}$ to $\frac{3}{8}$ in. long, deciduous; flowers rather exceeding $\frac{1}{4}$ in. long before expansion, about $\frac{1}{5}$ in. long when expanded, glabrous outside or very nearly so, numerous, on pedicels of about the same length, arranged in opposite axillary glabrous subsessile panicles likened to the head

of Medusa, 1 to 2 in. in diameter; calyx turbinate and adnate below to the ovary, glabrous except the ciliolate short truncate or obscurely dentate limb; corolla from whitish to sulphur-coloured; the tube campanulate, glabrous outside, $\frac{1}{3}$ in. long or a little longer; throat bearded; lobes 5, ovate, obtusely pointed, glabrous on both faces, about as long as the tube, valvate in the bud, reflexed in full flower; stamens 5, shortly exserted, glabrous; anthers oblong; disk glabrous or minutely puberulous; ovary glabrous, 2-celled; ovules solitary, pendulous; style glabrous, far exserted; stigma shortly calyptriform; fruit subglobose, glabrous, $\frac{1}{3}$ to $\frac{2}{5}$ in. in diameter, and sometimes longitudinally furrowed on opposite sides, green, marked at the apex with the remains of the calyx-limb, 2-celled; seeds cinnamon-red, didymous or solitary.

Golungo Alto.—By thickets along the margins of primitive forests near Cambondo and Trombeta; fl. Dec. 1855 and Jan. 1856, No. **3150**. Cambondo; fr. 1 July 1856. According to Senhor Lima of Dalatando called "Quiçange-quiangilla." No. **3151**. Cambondo; very young fr. Feb. 1855. No. **3152**. A subarborescent shrub, with a coffee-like habit, the sarmentose branches elongated, sometimes nodding or almost scandent; drupaceous fruit greenish; seeds cinnamon-coloured. Cambondo; fr. beginning of July 1856. Native name "Quiçanga Quiangilla." Coll. Carp. 646.

7. **C. Welwitschii** Hiern, sp. n.

A considerable tree, 20 to 30 ft. high, with a broadly spreading more or less pyramidal head; trunk straight, obtusely more or less tetragonal, 12 to 15 in. in diameter, never spiny; wood white, hard; branches and branchlets patent, tetragonal, glabrous or glabrescent; branchlets bisulcate, green; leaves opposite, usually oblong or oval-oblong, obtusely acuminate or cuspidate at the apex, obtuse rounded or more or less deeply cordate at the base, chartaceous-coriaceous, rather flaccid, glabrescent, shining above, pallid bright-green without gloss not at all reddish (as at length they become in the dried state) beneath, devoured with great avidity by insects, very large, often a foot and a half in length; lateral veins 10 to 12 on each side of the midrib, depressed above, in clear relief beneath; petiole short, ranging up to $\frac{1}{2}$ in. long; stipules broadly ovate, obtuse, ranging up to $1\frac{1}{2}$ in. long, deciduous, glabrescent and glossy at the back; flowers whitish-yellowish or of a pale-sulphur colour, $\frac{1}{2}$ in. long before expansion, about $\frac{1}{3}$ in. long when expanded exclusive of the exserted style, pentamerous, glabrous outside, on puberulous or subglabrous pedicels of $\frac{1}{15}$ to $\frac{1}{4}$ in., arranged in compound axillary cymes 2 to 3 in. in diameter; common peduncle glabrous, $\frac{1}{2}$ to 1 in. long, repeatedly dichotomous, compressed or almost 2-edged, somewhat deflexed; bracteoles successively smaller, the smallest ciliolate shortly hairy inside; calyx shortly campanulate, a little compressed at the base, occasionally bi-gibbous, the limb short and shortly dentate, minutely or obsoletely ciliolate; corolla-tube $\frac{1}{3}$ in. long, densely hairy inside; the throat bearded; lobes ovate-oblong, obtuse, $\frac{1}{6}$ in. long, faintly tomentellous inside, valvate in æstivation,

spreading at the time of the flower, rather fleshy, soon turning ferruginous-fuscous; stamens glabrous, 5, inserted on the throat of the corolla, alternating with the lobes; filaments shorter than the anthers; anthers sagittate-lanceolate, 2-celled, dehiscing longitudinally, of a cinnamon colour even in the bud; disk annular, fleshy, glabrous; ovary 2-celled, ovules solitary in the cells, pendulous; style glabrous, filiform, rather fleshy, smooth, exserted, $\frac{3}{8}$ in. long; stigma thick, ovoid, calyptriform, green, $\frac{1}{10}$ in. long, with several longitudinal whitish membranous angles; fruits drupaceous, pea-shaped, usually didymous, green when unripe, about $\frac{1}{4}$ in. long, arranged in cymes 4 to 5 in. in diameter. Sometimes heterophyllous, with a few cordiform smaller leaves in addition to the ordinary ones.

Golungo Alto.—In the dense primitive forests of Alto Queta, sparingly and flowering rather rarely; fl. middle of March 1856. The natives call this (and also *C. golungense* Hiern, No. 3153) "Molemba N-gongo" or "Mulangel-Ngombe" or "Muhunça-Hunça." No. **3148**. In the elevated forests of Alto Queta; unripe fr. July 1856. No. **3149**.

9. **C. hispidum** Benth. in Hook. Niger Fl. p. 409; Hiern, *l.c.*, p. 140.

Golungo Alto.—A sarmentose shrub, 4 to 6 ft. high; leaves black-green, shining, membranous, rather rigid; flowers tetramerous: corolla white outside, soon turning a little pale-yellowish; lobes of the limb reflexed at the time of full flower, inside of a deep sulphur colour, the whole corolla soon turning red; throat bearded; stigma green, mitriform, vertically winged with delicately membranous laminæ. By the lower thickets of the mountains of Queta, also near N-delle, not uncommon: fl. end of Dec. 1855, and in March 1856. Sometimes heterophyllous as in *Polysphæria* and *C. sylvaticum*. No. **3135**. A sub-sarmentose shrub 5 to 7 ft. high; stem quadrangular, sulcate; branches opposite, quite patent or even reflexed; branchlets hirsute with rigid distant ferruginous hairs; the younger leaves very densely ferruginous-hirsute, the adult ones bright herbaceous-green; bracts ovate from a broad base, acuminate, hirsute with rigid distant ferruginous hairs; berries pea-shaped. By thickets along the river Cuango at the base of the mountains of Alto Queta; fr. Aug. 1855. No. **3136**.

C. congense Hiern, *l.c.*, p. 141.

Pungo Andongo.—A robust sarmentose nearly scandent shrub, with pale-yellowish flowers. In thickets by the river Lutete; fl. 18 Oct. 1856. No. **3142**.

Bumbo.—Flowers white. In shady places by the river Bumbo; fl. Oct. 1859. No. **3140**.

10. **C. huillense** Hiern, sp. n.

A hard rigid erect shrub, 2 to 4 ft. high; branches subterete or roundedly tetragonal, ashy, glabrate; branchlets opposite, decussate, patent, shortly pubescent or glabrescent, sometimes foreshortened and quasi spine-like; leaves ovate or oval, obtuse at the apex, unequal and usually obtuse at the base, thinly coriaceous or firmly submembranous, glabrate or puberulous especially along the midrib and in the axils of the 2 to 4 inconspicuous veins on each side of the midrib beneath, $\frac{3}{4}$ to $1\frac{1}{2}$ in. long by $\frac{1}{4}$ to $\frac{3}{4}$ in. broad, green on both faces, somewhat fleshy, often concave or

longitudinally folded inwards; petioles short, ranging up to $\frac{1}{10}$ in. long; stipules ovate, apiculate, connate at the base, undivided, deciduous; flowers $\frac{1}{8}$ in. long when expanded, $\frac{1}{6}$ in. long before expansion, white, tetramerous, glabrous outside, on rather short puberulous pedicels, arranged in axillary shortly pedunculate cymes $\frac{1}{3}$ to 1 in. in diameter; common peduncle $\frac{1}{5}$ to $\frac{1}{4}$ in. long, puberulous; bracteoles small, deciduous; calyx-limb small, shortly dentate; corolla quadrifid; the tube $\frac{1}{16}$ in. long, pilose inside; the throat bearded; the lobes $\frac{1}{12}$ in. long, ovate, obtuse, glabrous on both faces, valvate in the bud, spreading or reflexed in full flower; anthers 4, glabrous, exserted; disk glabrous; ovary 2-celled, fleshy, campanulate, somewhat compressed; ovules solitary in the cells, pendulous; style exserted, glabrous, curved; stigma calyptriform.

Huilla.—In wooded thickets near the lake Ivantâla; fl. end of Feb. 1860. No. **3145**. In rather dry bushy places between Lopollo and Moninho, sporadic; fl. March 1860. No. **3146**.

11. **C. sylvaticum** Hiern, sp. n.

A robust climbing tawny-pubescent shrub, 5 to 7 ft. high; branches obtusely quadrangular, at length glabrate; leaves opposite, oval-oblong, acutely acuminate at the apex, unequal and more or less rounded at the base, thinly coriaceous, dark-green glossy and glabrate or with scattered hairs above, reddish (in the dried state) paler and hairy along the principal veins and midrib beneath, 2 to 5 in. long by $\frac{3}{4}$ to 2 in. broad; lateral veins 5 to 7 on each side of the midrib, rather slender, depressed above, in relief beneath; petiole $\frac{1}{3}$ to $\frac{1}{2}$ in. long, more or less hairy; stipules ovate, much acuminate, hairy on the back, interpetiolar, $\frac{1}{3}$ to $\frac{1}{2}$ in. long, deciduous; flowers $\frac{1}{8}$ in. long when expanded exclusive of the exserted style, on short pubescent pedicels, tetramerous, numerous, arranged in pedunculate bracteolate densely paniculate opposite axillary cymes $\frac{3}{4}$ to 1 in. in diameter, yellow-greenish, scarcely fragrant; common peduncle pubescent, $\frac{1}{4}$ to $\frac{1}{3}$ in. long; bracteoles lanceolate or subulate; calyx about $\frac{1}{30}$ in. long, hairy at the base, the limb glabrous except the ciliolate margin, 4-cleft; corolla-tube $\frac{1}{8}$ in. long, cylindrical, glabrous outside, pilose inside; throat bearded; lobes 4, ovate, obtuse, $\frac{1}{16}$ in. long, glabrous; anthers exserted, glabrous, oblong; disk glabrous, annular-fleshy; ovary hairy outside, 2-celled; ovules solitary in the cells, pendulous; style glabrous, exserted; stigma mitriform.

Pungo Andongo.—In forests near the base of Pedra Cabondo within the præsidium; fl. April 1857. No. **3134**.

The leaves below the branches are occasionally sub-orbicular and cordate, after the manner of the heterophyllous condition sometimes noticed in species of *Polysphæria*.

12. **C. tenuiflorum** Welw. ms. in Herb., sp. n.

A shrub, climbing or sarmentose-scandent: trunk not uncommonly 2 in. in diameter at the base; branches opposite, patent, obtusely quadrangular, glabrate, puberulous at the extremities; bark whitish; leaves oval-elliptical, acuminate or cuspidate at the

apex, rather obtusely narrowed or nearly rounded at the base, thinly coriaceous, glabrous or nearly so, shining and deep-green above, yellowish-green beneath, fuscous in the dried state, those on the flowering branches usually loosely pendulous, 1 to 3 in. long by $\frac{1}{2}$ to 2 in. broad; lateral veins about 4 on each side of the midrib, not very conspicuous; petiole $\frac{1}{8}$ to $\frac{1}{4}$ in. long, glabrescent; stipules lanceolate-subulate, puberulous, deciduous, about equalling the petiole; flowers pale yellowish, tetramerous, about $\frac{1}{8}$ in. when expanded exclusive of the exserted style, nearly $\frac{1}{4}$ in. inclusive of the style, numerous, on pubescent pedicels of about $\frac{1}{8}$ in. long arranged in dense compound pedunculate axillary panicles $\frac{3}{4}$ to 1 in. in diameter; common peduncle $\frac{1}{4}$ to $\frac{3}{8}$ in. long, pubescent in flower, glabrate in fruit; calyx about $\frac{1}{30}$ in. long, scattered with short hairs outside and ciliate on the margin; limb small, cleft, the lobes deltoid; corolla-tube $\frac{1}{10}$ in. long, cylindrical, glabrous outside, pilose inside; the lobes ovate, obtuse, sub-apiculate, $\frac{1}{20}$ in. long; throat somewhat pilose; anthers exserted, oblong, glabrous, on short filaments inserted about the throat; disk glabrous; ovary 2-celled; style glabrous, far exserted; stigma mitriform; ovules solitary in the cells, pendulous; fruit globose, occasionally bilobed-didymous, $\frac{1}{4}$ to $\frac{1}{3}$ in. in diameter, glabrous; the scar of the remains of the calyx-limb and the disk often far removed from the apex of the fruit.

Pungo Andongo.—By thickets in rocky wooded parts (Barrancos) of the præsidium; unripe fr. Dec. 1856. No. **3144**. In wooded thickets near Quilanga and Quibanga, not uncommon: fl. April 1857. No. **3143**. In young fr. Doubtfully referred here. No. **3252**.

13. **C. golungense** Hiern, sp. n.

A small evergreen glabrous tree of 10 to 15 ft. or more, or a tree-like shrub of 5 to 9 ft.; stem quadrangular, furrowed; branches spreading, angular, purplish and somewhat compressed towards the extremities and at the upper nodes; bark ashy; head widely spreading; leaves elliptical, obtusely or narrowly acuminate at the apex, somewhat narrowed at the base, thinly coriaceous, bright-green on both faces, shining with a varnish-gloss above, 3 to $5\frac{1}{2}$ in. long by $1\frac{1}{3}$ to $2\frac{2}{3}$ in. broad, widely wavy on the margin; lateral veins 5 or 6 on each side of the midrib, not conspicuous; petiole $\frac{1}{4}$ to $\frac{1}{3}$ in. long; stipules from a broad base subulate, sheathing, keeled-acuminate; flowers from whitish to greenish or yellowish, tetramerous, small, $\frac{1}{6}$ in. long when expanded, on puberulous pedicels of $\frac{1}{12}$ to $\frac{1}{5}$ in., arranged in opposite compound axillary cymes of 1 to $1\frac{5}{4}$ in. in diameter; common peduncles ranging up to $\frac{3}{4}$ in. long, puberulous; bracteoles small; calyx campanulate-cupshaped, about $\frac{1}{12}$ in. long, puberulous; limb truncate, very obscurely toothed; corolla-tube $\frac{1}{10}$ in. long, glabrous outside, pilose inside; throat bearded; lobes $\frac{1}{10}$ in. long, ovate, obtuse, faintly tomentellous inside, valvate in the bud, reflexed in full flower; stamens 4, glabrous, inserted at the throat of the corolla, exserted; anthers oblong, introrse, dorsifixed, 2-celled, longitudinally dehiscing; filaments reflexed; disk shortly hairy,

annular, fleshy; ovary 2-celled; ovules solitary, pendulous; ovules thick; style far exserted, glabrous, rather exceeding $\frac{1}{4}$ in. long, slender; stigma rather thick, mitriform, cleft at the apex into two ovoid little lobes; fruit (unripe) pea-shaped with the calyx-limb distant from the apex or usually sub-didymous with the persistent calyx-limb or its remains central at the apex, glabrate, $\frac{1}{4}$ in. long, 2- or 1-celled.

Occasionally the plant is heterophyllous, with some smaller cordiform leaves in addition to the ordinary ones.

GOLUNGO ALTO.—At the borders of primitive forests along the banks of the river Cuango; fl. and unripe fr. middle of Dec. 1855. Native name "Molemba N-Gongo." No. **3153**. In the dense forests of Alto Queta, sporadic; fl. and fr. Aug. 1855. Also behind Cacarambola; fl. and fr. 1 Sept. Native name "Molamgela-n-gombe." No. **3154**. Branch with foliage only. No. **3155**. At the borders of the primitive forest as a tree, in secondary woods as a bush; at N-delle in Queta occidental; fl. and fr. May 1856. Native name "Mulanguel-engombe." No. **3156**.

The same native name is used for *C. Welwitschii* Hiern; No. 3148. Another native name, apparently for both, is "Muhunça-Hunça."

14. **C. umbrosum** Hiern, sp. n.

A small bushy tree, with spreading thick sub-terete glabrate opposite branches and a broad shady head; branchlets shortly hispid-tomentose, somewhat compressed, leaves opposite, broadly ovate or oval, cuspidate or subacuminate at the apex, unequally obtuse or nearly rounded at the base, thickly membranous, dark-green and nearly glabrescent above, paler-green and more or less tomentellous or shortly hispid-tomentose especially along the veins beneath, about $2\frac{1}{2}$ to 3 in. long and broad or probably larger; lateral veins 6 to 10 on each side of the midrib, slender; petiole $\frac{1}{4}$ to $\frac{3}{8}$ in. long, shortly hispid-tomentose; stipules from a broad ovate base subulate, deciduous; flower-buds pentamerous, numerous, in densely crowded, axillary and sub-terminal, sub-globose, shortly pedunculate cymes, subsessile; ovary 2-celled; ovules solitary in the cells, pendulous.

HUILLA.—In forests composed of *Parinari* near Lopollo; fl.-bud Dec. 1859. No. **2576**.

Apparently nearly related to *C. crassum*.

15. **C. platyphyllum** Hiern, sp. n.

A robust, hard, very rigid, dense shrub, 3 to 6 ft. high; branches tortuous, ferruginous, glabrate, sub-terete; branchlets woolly-hairy at the extremities, densely leafy; leaves opposite, large, obovate-oblong, rounded or sub-cuspidate at the apex, more or less wedge-shaped at the base, thinly coriaceous, very dark-green and scattered with short curly tawny hairs above especially along the midrib and 8 to 10 pairs of lateral veins, more densely hairy and pale-tawny beneath, 2 to 6 in. long by 1 to $2\frac{1}{2}$ in. broad; petiole $\frac{1}{8}$ to $\frac{1}{4}$ in. long, rather thick, hairy; stipules lanceolate-subulate from a broad base, hairy, deciduous, about $\frac{1}{3}$ to $\frac{2}{5}$ in. long; inflorescence axillary or lateral on the branchlets,

many-flowered, about 1 in. in diameter, tomentose; flowers pentamerous; calyx-limb deeply 5-lobed; the lobes ovate or lanceolate, tomentose on both faces, about $\frac{1}{8}$ in. long after the fall of the corolla; disk fleshy, glabrous; ovary tomentose, campanulate, 2-celled, very fleshy; ovules solitary, pendulous; young fruit obliquely ellipsoidal, sub-glabrate, about 1 in. long, apparently 1-seeded, solitary.

Huilla.—In the open forests of Monino, sporadic; after the fall of the corolla and in young fr., Dec. 1859. No. **2583**.

30. **VANGUERIA** A. L. Juss. Gen. Pl. p. 206 (1789); Benth. & Hook. f. Gen. Pl. ii. p. 111.

1. **V. infausta** Burch. Trav. ii. p. 258, note, and p. 259, fig. (1824); Hiern in Oliv. Fl. Trop. Afr. iii. p. 147.

Huilla.—A bush, 10 to 15 ft. high, decussately branched; leaves ovate-elliptical or ovate-lanceolate, deciduous; flowers from greenish to yellowish; unripe fruit greenish-purplish with a yellowish tinge, as large as a small hazel-nut. In wooded rocky rather elevated situations near Lopollo; fl. 15 Dec. 1859; fr. 15 Jan. 1860. No. **5351**.

2. **V. canthioides** Benth. in Hook. Niger Fl. p. 408 (1849); Hiern, *l.c.*, p. 149.

Golungo Alto.—A bush, 3 to 10 ft. high, sometimes arborescent: the central stem after the fall of the leaves showing from the petioles of the leaves ternate spines which are altogether absent from the circumferential branches; young leaves membranous, the older ones chartaceous-rigid, early deciduous; flowers greenish; calyx campanulate, with 5 acute short distant teeth; corolla salver-shaped, the tube equalling in length the five segments of the limb which are reflexed at the time of full flower; stamens 5, inserted on the bearded throat of the corolla; anthers ovate-acuminate, brick-red, 2-celled, dehiscing longitudinally; disk annular, thick; ovary covered by the calyx, 5-celled; ovules solitary, pendulous; style central, rather thick, a little curved below the apex: stigma large, pileiform, green, obtusely lobed at the apex; young berries green, pentagonal. In shady forests at the base of the mountains of Queta, near Camilungo, rather rare; fr. June 1855. At the great waterfall of the river Cuango; fl. Sept. 1854; fl.-bud 11 Oct. 1855; fl. May 1856. No. **5347**.

3. **V. umbellulata** Hiern, *l.c.*, p. 150.

Pungo Andongo.—A shrub, almost arborescent, with sub-scandent branches. In wooded parts of Pedras de Guinga; after the fall of the corolla and in fr. Jan. 1857. No. **5348**. A bush, 10 to 12 ft. high; branches spreading; branchlets pendulous-nodding; young fruit green, sub-globose. In the primitive forests of the Calemba Island; young fr. 12 March 1857. No. **5349**.

In the absence of the flowers from the specimens, these determinations are doubtful; they must be compared, especially the latter No., with *V. euonymoides* Schweinf.

31. **FADOGIA** Schweinf.; Benth. & Hook. f. Gen. Pl. ii. p. 111, excl. syn.

Pachystigma Hochst. (1842) has been united with this genus by K. Schumann, and being older has been adopted by him in the

naming of the species; Hochstetter's plant appears to me rather to belong to *Cuviera*.

1. **F. Cienkowskii** Schweinf. Rel. Kotsch. p. 47, t. 32 (1868); Hiern in Oliv. Fl. Trop. Afr. iii. p. 154.

Golungo Alto.—A suffruticose herb, with the habit of a *Lysimachia*; rootstock woody, very hard, horizontal, occasionally tuberous-swelled; stems several, cylindrical at the base, 3- to 4-angular above, in the living state more or less glaucous-green, turning hoary in the dried state, 1 to 2 ft. high; leaves opposite or ternate or rarely quaternate, membranous, dry, rather rigid; flowers from whitish to greenish; calyx usually 6-toothed, greenish; corolla rather fleshy throughout, yellow, the limb 4- or 5-, rarely 7-cleft, the lobes reflexed at the time of flowering; stamens as many as the corolla-lobes and alternating with them, reflexed in flower; anthers reddish; style straight, sub-angular, surrounded at the base by the thick rather broad disk; stigma capitate, with 3 or 4 thick erect ovate obtuse lobes, giving the whole style the appearance of a minute tulip with its scape. In dry elevated sandy-rocky but earthy pastures submitted to annual burnings for the purposes of cultivation, abundant, but only seen near Banza in Sobato Bumba; fl. middle of Oct. 1855; fr. March 1856. No. **2566**. In rocky-sandy pastures among short herbage between Bumba and Banga Aquitamba; fr. March 1856. No. **2577**. Habit precisely that of a *Lysimachia*; flowers yellow; berries pulpy, black. In Sobato de Bumba; fr. Oct. 1855. Coll. Carp. 644.

Pungo Andongo.—On the grassy slopes of Pedras de Guinga, sparingly; fl. Jan. 1857. No. **2578**.

Huilla.—A herb, with a woody rootstock, and several stems a foot high or rather more; leaves beneath with a thick midrib and raised reticulation; flowers white or whitish; fruit agreeably acid-sweet. In wooded meadows between Eme and the great lake of Ivantâla; fl. and ripe fr. beginning of March 1860. This includes a form with narrower lanceolate-oblong leaves. No. **2565**. In the lower rocky thickets between Mumpulla and Humpata, sporadic; fl. Oct. 1859. No. **2577***b*. An undershrub, 1½ to 2 ft. high, with the habit of a *Lysimachia*; stems numerous; leaves 4-verticillate; flowers clustered in the axils, yellowish, pentamerous or hexamerous; berries black-bluish, as large as a good-sized pea, sub-globose, like a whortleberry in taste and shape but a little larger, sweet-acidulous, edible, with 2 to 4 reniform seeds. In the interior brought to the markets by the negroes in December and January and sold for ardent liquors or gunpowder. Native name "Muninghi" (Muningui?) plural; sing. "Ninghi." At Lopollo; fr. Dec. 1859 and April 1860. Coll. Carp. 33.

2. **F. Welwitschii** Hiern, sp. n.

A little shrub, 4 to 8 in. high, glabrous or very nearly so, not spiny; primary stem decumbent-ascending, sub-terete, dark-ashy, densely branched apparently after the burning of the upper part of the plant; branches angular and often trigonous above, densely leafy towards the extremities; leaves mostly ternate, oblanceolate, rounded sub-apiculate or somewhat acuminate at the apex, gradually wedge-shaped towards the subsessile base, firmly and rigidly sub-coriaceous, green on both faces, very slightly paler and obsoletely scaly beneath, 1 to 5 in. long by ⅕ to 1 in. broad, sub-erect or making a small angle with the branch; lateral veins

4 or 5 on each side of the midrib, slightly reddish (as well as the net-veins) but scarcely conspicuous; stipules ovate or lanceolate, $\frac{1}{6}$ to $\frac{1}{5}$ in. long, entire, deciduous; inflorescence axillary, paniculate, puberulous or glabrate, about 1 in. in diameter; common peduncle $\frac{1}{3}$ to $\frac{1}{2}$ in. long; pedicels ranging up to $\frac{1}{4}$ in. long; bracteoles lanceolate, small; calyx $\frac{1}{8}$ to $\frac{1}{6}$ in. long, the limb 5-partite; segments lanceolate-oblong, apiculate, somewhat unequal, $\frac{1}{20}$ to $\frac{1}{12}$ in. long, glabrate or obsoletely puberulous, persistent; disk glabrous or obsoletely scaly; ovary shortly campanulate, slightly compressed, glabrous, fleshy, 2-celled; cells 1-ovuled; ovules pendulous; young fruit sub-globose, somewhat compressed, about $\frac{1}{2}$ in. in diameter, umbilicate at the apex and crowned with the persistent not accrescent calyx-lobes.

Huilla.—In bushy pastures on the left bank of the river of Lopollo, sporadic; after the fall of the corolla and in young fr. Jan. 1860. No. **2584**.

3. **F. fuchsioides** Welw. ex Oliv. in Trans. Linn. Soc. xxix. p. 85, t. 50 (1873); Hiern, *l.c.*, p. 155.

Pungo Andongo.—Berries reddish. In Mata de Mangue; ripe fr. Jan. 1857. Only one specimen found, No. **2567***b*. A herb almost suffrutescent or an undershrub, a foot high; rootstock thick, fleshy-woody; stems few, erect; leaves thick, fleshy with the nerves purple beneath; flowers wine-purple, afterwards turning red, rather fleshy, green-yellowish inside, with reflexed limb; stigma remarkable, as in the genus; fruit red. In the sandy forests of Cazella, on the left bank of the river Lutete near the confines of the district of Ambaca, very rare, in company with a dwarf Meliacea (*Nelanaregam alata* O. Kuntze, Welw. No. 1301) and *Sesamum angolense* Welw. No. 1645; fl. 18 Oct. 1856. No. **2568**. In sandy forests at Luxillo, sparingly; fr. Feb. 1857. A form with small fruit $\frac{1}{4}$ to $\frac{1}{3}$ in. in diameter; leaves opposite or ternate, marked with red veins. No. **2568***b*.

Huilla.—An erect undershrub or shrubby herb, 1 to 3 ft. high, cæspitose or at least with several stems; rootstock thick, hard-woody, horizontal or obliquely descending; stems strict, scarcely woody, purplish or reddish, cylindrical below, obtusely trigonous from the middle to the apex, verticillately leafy; leaves mostly ternately or quaternately or rarely 5—6-verticillate, softly coriaceous, lanceolate-ovate or elliptical, entire, glabrous or more or less shaggy; petiole short, articulate with the stem; stipules interpetiolar, entire; peduncles axillary, typically ternate-verticillate and 3-flowered, blood-red; pedicels as long as the common peduncle or shorter; flowers handsome; calyx blood-red; the tube obconical, adnate to the ovary; the limb superior, patelliform, truncate; corolla coriaceous or fleshy-membranous, blood-red, like that of a fuchsia; the tube long, shaggy inside; the throat naked; the lobes of the limb 6 to 8, valvate in the bud, arching-reflexed in full flower, yellowish inside; anthers 6 to 8 corresponding to the number of the corolla-lobes, sessile or subsessile, inserted in the sinuses between the corolla-lobes, linear, exserted, all alike; ovary inferior, 6 to 8-celled; the cells one-ovuled; style simple, conical, surrounded at the base by the epigynous disk, gradually narrowed, exserted; stigma precisely crown-shaped, broadly truncate both at top and bottom, stigmatose around the circumferential sides, broadly 6- to 8-radiate or even somewhat 6- to 8-lobed at the apex and

there not stigmatose, greenish as well as the whole style ; berry fleshy, more or less globose, crowned with the cupuliform calyx-limb and with the remains of the disk, typically 6- to 8-celled ; the cells one-seeded ; seeds reniform ; testa whitish-yellow. In bushy hilly places on a sandy clay soil, between Lopollo and the great lake Ivantâla ; fl. and young fr. Jan. 1860. No. **2567**.

4. **F. stenophylla** Welw. ex Hiern, *l.c.*

Huilla.—A herb, scarcely a foot high ; rootstock woody ; stems several, erect, occasionally flowering before the expansion of the leaves, of a pretty green colour ; flowers from whitish to violet-purplish, with a violet-blue tinge. In bushy pastures on the right bank of the Lopollo stream, between Lopollo and Catumba, sparingly ; fl. Nov. and Dec. 1859 ; fr. 1860. No. **2570**.

5. **F. lactiflora** Welw. ex Hiern, *l.c.*, p. 156.

Huilla.—An erect herb or undershrub, 1 to 2 ft. high, with the habit of a *Phlomis* ; rootstock woody ; stems several, strict ; flowers handsome, milk-white ; calyx-teeth rather long ; stigma crown-shaped. In hilly thickets near Lopollo ; fl. Jan. 1860 ; fr. April 1860. No. **2569**.

32. **CUVIERA** DC. ; Benth. & Hook. f. Gen. Pl. ii. p. 112.

1. **C. angolensis** Welw. ex K. Schum. in Engl. & Prantl, Nat. Pflanzenfam., iv. 4, p. 94, fig. 33, J (1891), without descriptive diagnosis.

A small glabrous pyramidal tree, 12 to 20 ft. high, or in cultivated fields (*arimos*) usually only 8 to 12 ft. ; sap milky ; trunk slender, straight, destitute of branches below, but densely armed with opposite, decussate, strong, very acute, quite patent spines of 1 to 2 in. in length ; branches and branchlets green, the latter swelled at the nodes ; leaves oblong, opposite, usually cuspidate at the apex, oblique and rounded at the base, papery, smooth, 4 to 9 in. long by 1½ to 4 in. broad, dull-green above, paler beneath, those on the older branches pendulous ; petiole ⅛ to ⅓ in. long ; lateral veins about 8 on each side of the midrib, rather slender and beneath conspicuous ; stipules sheathing, keeled, acuminate, about ⅜ to ½ in. long ; inflorescence axillary, branched, 2 to 4 in. long, pale yellow-greenish outside throughout except a bright rosy stellate patch about the naked throat of the corolla ; pedicels very short ; common peduncle ¼ to 1 in. long ; bracteoles sub-linear, ranging up to 1 in. in length ; calyx including and adnate to the ovary ; tube short, campanulate-ventricose, obtusely 3- to 4-angular, deeply 3- to 5-lobed ; the segments elongate-lanceolate, unequal in length, bractlike, exceeding the corolla, herbaceous-green, ½ to 2 or 3 in. long ; corolla shortly salver-shaped, fleshy-coriaceous, deep herbaceous-green outside ; tube short, bright-red inside, at the base inside with a ring of silvery shining hairs directed downwards ; limb 5-cleft, shortly rotate ; segments lanceolate or ovate-acuminate, rigid, green, expanded in a stellate manner in full flower, valvate at the base in æstivation ; the tips long, acuminate or subulate, contorted in the bud ; stamens 5, inserted in the sinuses of the

corolla-lobes around the ring of hairs; rigid, exserted; filaments compressed-cylindrical, fleshy, curved-patent at the time of flowering; anthers ovate, cordate, introrse, 2-celled, obtuse at the apex, basifixed; cells separate at the base, cohering at the apex longitudinally, yellow; ovary adnate to the calyx-tube, 5-celled; cells 1-ovuled; disk a little elevated, flat; style thick, columnar, rosy, densely pilose; stigma mitriform, large, obtuse, stigmatose and cleft at the apex; fruit oblique, deeply furrowed, about 1 in. long, crowned with the more or less persistent calyx-limb or with its remains.

Golungo Alto.—In rather dry places, among tall grasses and in thickets, among the mountainous forests of Alto Queta; fl. April and May 1855; fr. end of August 1855. No. **2564**. Coll. Carp. 648.

33. **ANCYLANTHOS** Desf.; Benth. & Hook. f. Gen. Pl. ii. p. 112 (*Ancylanthus*).

1. **A. rubiginosus** Desf. in Mém. Mus. Par. iv. p. 5, t. 2 (1818); Welw. in Journ. Linn. Soc. iii. p. 153 (1859); Hiern in Oliv. Fl. Trop. Afr. iii. p. 158.

A. ferrugineus Welw. in Andr. Murr. Journ. Trav. i. p. 29 (1868).

Pungo Andongo.—A shrub, 3 to 5 ft. high, branched from the base, at first sight looking exactly like an Azalea; leaves soft, rather thick, scarcely coriaceous, fully developed only after the flowers; flowers rather rigid, rather dry, bright brick-red. In rocky thickets, from the præsidium to the district of Ambaca; abundant; fl. Nov. 1856: fr. Feb. 1857. No. **3159**.

2. **A. fulgidus** Welw. ex Hiern, *l.c.*, p. 159.

Ancylanthus (sp.), Welw. in Arch. Sc. Phys. et Nat. Genev. 1861, p. 202.

Huilla.—A shrub, 3 to 5 ft. high, rather densely virgate-branched; stems sparingly and patently branched; branches rufous-tomentose; corolla brilliantly orange-red. In wooded thickets from Mumpulla to Lopollo; fl. Oct. 1859. No. **3160**. At Lopollo in front of Senhor Kneissman's house; fl. and fr. Dec. 1859 and Jan. 1860. No. **3161**. A shrub, 4 to 6 ft. high, with handsome flowers. In thickets; fr. Jan. 1860. Coll. Carp. 87.

Perhaps only a variety of the last species.

3. **A. cinerascens** Welw. ex Hiern, *l.c.*

Pungo Andongo.—An erect, patently branched shrub, about 4 ft. high, the young parts cinereous-tomentose throughout. Berries from yellow to reddish, but little juicy. In the denser forests of Mutollo near the præsidium; fr. Jan. 1857. No. **3162**. A slender shrub, 3 to 4 ft. high; fruit pulpy, red-velvety; seeds larger than in *A. rubiginosus* Desf. In forests by the river Mangue; fr. 31 Jan. 1857. Coll. Carp. 659.

4. **A. cistifolius** Welw. ex Hiern, *l.c.*

Pungo Andongo.—An erect, sparingly branched shrub, 1½ to 3 ft. high. In the forests composed of Mimoseæ by Serra de Pedras de Guinga, sporadic; fr. Jn. 1857. No. **3163**.

34. **CRATERISPERMUM** Benth. ; Benth. & Hook. f. Gen. Pl. ii. p. 112.

1. **C. laurinum** Benth. in Hook. Niger Fl. p. 411 (1849); Hiern in Oliv. Fl. Trop. Afr. iii. p. 160.

Golungo Alto.—A bush, 12 to 15 ft. high ; trunk 2 to 3 in. in diameter at the base ; branches rather erect ; young fruit drupaceous, green. In the more elevated forests of Sobato de Quilombo ; unripe fr. middle of July 1856. No. **3116.**

Pungo Andongo.—An arborescent shrub, 5 to 8 ft. high ; branches elongated, as well as the branchlets somewhat drooping ; leaves coriaceous ; stipules very broad, almost connate and truncate without a mucro, or sometimes rounded-obtuse and mucronate ; inflorescence like that of *Tricalysia* ; flower-buds green-whitish ; fruit crowned with the cup-shaped calyx-limb, minutely warted outside. In the small damp woods among the more elevated rocks within the præsidium, sporadic ; fl. and fl.-bud beginning of Nov. 1856. No. **3115.**

2. **C. montanum** Hiern, *l.c.*, p. 162.

Island of St. Thomas.—Leaves yellowish-green. Mucumbrara ; fl.-bud Dec. 1860. No. **3158.**

35. **PAVETTA** L. ; Benth. & Hook. f. Gen. Pl. ii. p. 114.

1. **P. angolensis** Hiern, sp. n.

A shrub, 2 to 5 ft. high, sometimes shaped like a miniature tree with spreading or deflexed-ascending branches, in other cases with twisted branches as if scandent, evergreen, glabrous or very nearly so ; branchlets quadrangular, whitish, but towards the extremities green, somewhat compressed and leafy ; leaves opposite, obovate-elliptical, cuspidate or acuminate at the apex, wedge-shaped and often unequal at the base, thinly coriaceous, the blade 3 to 5 in. long by 1 to 2 in. broad, rather glossy, turning livid in the dried state ; lateral veins 7 to 9 on each side of the midrib, starting at about 60°, slender, not conspicuous ; petioles ranging up to $\frac{1}{2}$ in. long ; stipules widely sheathing, almost retuse, the midrib keeled, projecting in a long mucro ; flowers tetramerous, rather fleshy, snow-white, fragrant, very handsome ; $\frac{3}{4}$ to 1 in. long when expanded, exclusive of the midrib, subsessile, many together arranged in globular sessile terminal condensed capitate cymes ; calyx ovoid, the limb deeply quadrifid ; the segments elongated-subulate, erect in the flower, $\frac{1}{4}$ in. long or rather longer, persistent ; corolla glabrous, salver-shaped ; tube slender, elongated, $\frac{2}{3}$ to $\frac{3}{4}$ in. long ; limb deeply 4-cleft ; segments oblong-lanceolate, $\frac{1}{4}$ to $\frac{1}{3}$ in. long, shortly hooded-mucronulate at the tip, reflexed-spreading in full flower ; stamens 4, alternating with the corolla-lobes, inserted on its throat, exserted ; filaments filiform, much shorter than the anthers ; anthers linear, 2-celled, dehiscing longitudinally, soon turning black, about $\frac{1}{4}$ in. long ; disk thick, elevated, sub-tubular ; ovary included in and adnate to the calyx-tube, 2-celled ; cells 1-ovuled ; style cylindrical, very much elongated, $2\frac{1}{4}$ in. long, white, exceeding the corolla-tube by about $1\frac{1}{2}$ in., gradually terminating in the long-clavate stigma,

scarcely bifid at the tip; fruit depresso-subglobose, glossy, about $\frac{3}{8}$ in. in diameter, 2-celled, 2-seeded, crowned with the persistent calyx-limb.

GOLUNGO ALTO.—In dense thickets at the borders of primitive forests at the base of the very lofty mountain of Cungulungulo; with imperfect fl. Feb. 1855. No. **3187**.

PUNGO ANDONGO.—In densely shaded parts of Mata de Cabondo, within the præsidium, not uncommon; fl. end of Dec. 1856. No. **3185**. Mata de Cabondo; fr. April 1857. No. **3186**.

This species is allied to *P. Cooperi* Harv.

2. **P. nitidula** Welw. ms. in Herb.

A very elegant bush or little tree of 12 to 15 ft. with the habit almost of a *Laurus*, or in secondary thickets a shrub of 4 to 6 ft., very much branched, glabrous and rather shining throughout except the inflorescence and the base of the stipules inside; branches roundly quadrilateral, somewhat compressed towards the extremities; leaves narrowly elliptical, pointed or apiculate at the apex, wedge-shaped at the base, coriaceous, rigid, dark-green and glossy above, paler and brownish-subglaucescent beneath, 4 to 6 in. long by 1 to $1\frac{3}{4}$ in. broad; margin narrowly revolute; lateral veins 9 to 12 on each side of the midrib, slender, not conspicuous; petioles ranging up to about $\frac{1}{2}$ in. long; stipules broadly ovate, supra-petiolar, nearly connate at the base, keeled-subulate, about $\frac{1}{4}$ in. long, hairy at the base inside; flowers rather large, handsome, rosy-white or pale-purple, slightly aromatic, nearly $\frac{1}{2}$ in. long when expanded exclusive of the exserted style, tetramerous, on short rather thick bracteolate puberulous pedicels, arranged many together in rather dense corymbose-hemispherical usually sessile cymes 2 to 4 in. in diameter, terminating the branches; calyx puberulous; the limb quadrifid half way down, shortly hairy on both sides, campanulate-hemispherical, about $\frac{1}{12}$ in. long; the lobes roundly deltoid, somewhat keeled and keeled-apiculate; corolla between funnel-shaped and salver-shaped, glabrous outside; the tube about $\frac{1}{3}$ in. long, widening upwards, thinly hairy inside, densely bearded at the throat; lobes 4, about $\frac{3}{8}$ in. long, oval-oblong, keeled-emarginate at the apex, contorted dextrorsely (as seen from above) in the bud, spreading or reflexed in full flower; anthers about $\frac{1}{4}$ in. long, linear, glabrous, longer than the filaments, exserted; disk fleshy, elevated, glabrous; ovary 2-celled, somewhat compressed, the cells 1-ovuled; ovules imposed on the fleshy placentas; style about $\frac{3}{4}$ in. long, glabrous below, slender, projecting about $\frac{3}{8}$ in. beyond the expanded corolla, gradually thickening upwards into the narrowly clavate hairy stigma, bidentate at the apex; unripe fruits numerous, subglobose, slightly turbinate at the base, crowned at the apex with the persistent puberulous calyx-limb, $\frac{1}{4}$ in. in diameter, glabrate or nearly so, 2-celled, 2-seeded.

PUNGO ANDONGO.—In rocky shady places, and in wooded thickets within the præsidium, especially by the streams Cazella and Cabondo, abundant; fl. from Oct. to April; nearly ripe fr. April 1857. No. **3189**.

Much resembling *P. Baconia*, but the calyx-lobes are not imbricate and are persistent on the fruit.

3. **P. Baconia** Hiern in Oliv. Fl. Trop. Afr. iii. p. 176.

Golungo Alto.—A shrub, 12 ft. high, with a widely spreading leafy head; trunk 2 in. in diameter at the base; branches erect-spreading; leaves evergreen; flower-buds greenish; fruit drupaceous, juicy, either sub-globose or didymous, soft and turning black when ripe, 1- to 2-seeded. In the forests of Sobato Quilombo; fl.-bud and ripe fr. middle of July 1856. No. **3203** and Coll. Carp. 647.

Cazengo.—A shrub, 3 to 5 ft. high, with a coffee-like habit, white flowers, and coriaceous evergreen leaves. In shady forests along the river Luinha, and also between Cambondo and the Luinha; Dec. 1854. Colonial name "Primo de Caffé." The specimens were given to Welwitsch by Senhor Pereira, and are without corollas. No. **3188**.

The condition of the specimens renders these determinations somewhat doubtful.

4. **P. radicans** Hiern, sp. n.

A small low-growing shrub, about 6 in. high; the little trunks bending down trailing or decumbent and rooting, glabrate; branchlets pubescent with short hoary spreading hairs, erect or ascending, leafy towards the extremities; leaves (perhaps not fully developed on the specimens) opposite, elliptical or somewhat obovate, obtusely narrowed at the apex and apiculate with a cartilaginous tip, unequally narrowed at the base, firmly chartaceous, dark-green and puberulous or hispidulous at least along the midrib above, rather paler or browner and more hairy beneath, 1 to 1½ in. long by ⅓ to ⅔ in. broad; lateral veins about 4 on each side of the midrib, inconspicuous; petiole $\frac{1}{12}$ to $\frac{1}{6}$ in. long, hispidulous; stipules ovate, subulate-acuminate, almost connate at the base, hairy at the back, glabrous inside, about $\frac{1}{6}$ in. long, deciduous; flowers white, fragrant, tetramerous, about 1 in. long when expanded exclusive of the exserted style, on short hoary-pubescent pedicels, few or several together in abbreviated lateral axillary or terminal cymes or terminating short lateral branchlets; bracteoles small, stipuliform; calyx $\frac{1}{6}$ in. long, shortly hairy outside, campanulate, somewhat compressed, the limb $\frac{1}{12}$ in. long, 4-cleft, the lobes ovate or deltoid, hairy on both sides; corolla scattered with pubescent hairs outside, salver-shaped; tube ¾ to 1 in. long, hairy inside, slender; throat bearded; lobes oval-oblong, pointed at the apex, about $\frac{1}{4}$ in. long, comparatively glabrous inside, but with some hairs especially near the base, contorted in the bud dextrorsely (as seen from above), spreading or reflexed in flower; anthers linear, about $\frac{1}{6}$ in. long, glabrous, twice as long as the filaments, exserted; ovary 2-celled; ovules solitary, on fleshy placentas; style slender, glabrous, entire, exserted nearly ½ in. beyond the expanded corolla.

Huilla.—In thickets near Lopollo; fl. Dec. 1859. No. **3184**.

Nearly related to *P. subcana* Hiern or to *P. canescens* DC., it differs from each by its low habit; in length of flower and breadth of leaf it approaches *P. incana*.

5. **P. Schumanniana** F. Hoffm. ex Engl. Pfl. Ost-Afr., C., p. 389.

Huilla.—A shrub, 2 to 4 ft. high, with numerous stems; corolla white, contorted in the bud. In wooded thickets between Lopollo and Monino, abundant; fl. Dec. 1859; fr. March 1860. No. **3190**.

6. **P. andongensis** Hiern, sp. n.

An erect branched shrub: branches shortly pubescent or glabrescent, ashy, more or less quadrangular, compressed at the nodes; branchlets leafy, pubescent-hispidulous with pallid spreading hairs, somewhat compressed towards the extremities; leaves oblanceolate or obovate, opposite, rounded or obtuse and usually pointed or subapiculate at the apex, gradually wedge-shaped to the subsessile base, not fully developed at the time of the flower, deciduous, subcoriaceous, dark-green and scabrid with short scattered hairs above, paler and scabrid-tomentose beneath, ranging up to 6 in. long by $1\frac{1}{4}$ in. broad; lateral veins about 8 pairs, not conspicuous; stipules ovate, acuminate-subulate, supra-axillary, hairy at the back, glabrous inside, about $\frac{1}{2}$ in. long; flowers white, sweetly fragrant, tetramerous, about $\frac{1}{3}$ in. long exclusive of the exserted style, on very short hairy pedicels, many together arranged in opposite dense globular lateral and subterminal abbreviated shortly pedunculate bracteate cymes of 1 to $1\frac{1}{4}$ in. in diameter mostly in the axils of the leaves of the previous season; bracts and bracteoles unequal, ovate, hairy on the back, glabrous inside; common peduncle about $\frac{1}{8}$ in. long; calyx campanulate, hairy outside, $\frac{1}{6}$ in. long; the limb $\frac{1}{10}$ in. long, glabrous inside, green, cleft half way; lobes ovate; corolla nearly but not quite glabrous outside, shortly salver-shaped; tube bearded inside about the throat and on the upper part, $\frac{1}{4}$ in. long; lobes oval when flat, linear-oblong as inflexed at the apex and margins, apiculate, glabrous inside except the base, $\frac{1}{5}$ in. long, contorted dextrorsely (as seen from above) in the bud, spreading in a star at the time of the flower, inflexed at the tip and along the margin; anthers 4, sub-linear, glabrous, $\frac{1}{6}$ in. long, 2-celled, acuminate at the apex by reason of the prolongation of the connective, erect at the time of the flower, exserted, soon reflexed; disk glabrous, fleshy, annular; ovary 2-celled, fleshy; ovules 2, imposed on the fleshy placentas; style glabrous, exserted to a distance of $\frac{2}{5}$ in. beyond the expanded corolla, thickened and somewhat club-shaped above, cleft at the apex; lobes small, 2, stigmatose on the inner side; young fruit pea-shaped, $\frac{1}{4}$ in. long, glabrate except the hairy calyx-limb.

Pungo Andongo.—In rocky thickets about the præsidium, as for example at Lombe and Caghui; fl. and young fr. 11 Oct. 1856. No. **3191**.

36. **COFFEA** L.; Benth. & Hook. f. Gen. Pl. ii. p. 114.

1. **C. arabica** L. Sp. Pl., edit. 1, p. 172 (1753); Hiern in Oliv. Fl. Trop. Afr. iii. p. 180; Welw. Apont. p. 549, sub n. 87, and Synopse Explic. p. 9, n. 13; Ficalho, Pl. Uteis p. 199 (1884).

Golungo Alto.—A small tree, 10 to 15 ft. high; trunk 9 or very rarely 12 in. in diameter at the base, straight in the lower part, then

in old age inclining ; branches horizontal or even nodding, in old age mostly unilateral. Quite indigenous in the more elevated primitive forests throughout the district, and also often cultivated ; fl. Dec. 1855 and Feb. 1856. No. **3183.**

The coffee-tree is native in nearly all the virgin forests of the mountainous districts, chiefly in elevated positions ; it occurs in this manner in CAZENGO, DEMBOS, and HUNGO, and from the wild plants seedlings are raised to stock the coffee-plantations in Golungo Alto and Cazengo. It is quite erroneous to say that the coffee tree was introduced into Angola by missionaries. It reaches a height of 20 ft., and its trunk 6 to 18 in. in diameter, but when so large as this it produces only a poor crop, and on that account the colonists habitually cut down the old trees to the height of a foot, for they find that this treatment induces at once from the old stock numerous vigorous shoots that in the following year are covered with nice young fruits. The wood is one of the most compact and durable in the interior, and is very suitable for furniture, such as chairs, tables, bedsteads, etc. ; it is also excellent for various articles of turnery, and takes a good and very durable polish. The native name in these districts is "Murianbambe" or "Muria Nbambe," which is composed of the words Muria (gut) and Nbambe (antelope), because a species of antelope there has a preference for the leaves of this tree.

COLL. CARP. 654 consists of coffee seeds as a sample of the coffee of the Mahungos. COLL. CARP. 655 consists of coffee-seeds "Caffé de Moçambique" from the London 1862 Exhibition, perhaps belonging to *Coffea Zanguebariæ* Lour.

2. **C. liberica** Hort. Bull. ex Hiern in Trans. Linn. Soc. Ser. 2, i. p. 171, t. 24 (1877), and in Oliv. Fl. Trop. Afr. iii. p. 181 ; Ficalho, *l.c.*, p. 204 ; Froehner in Engl. Bot. Jahrb. xxv. p. 269 (1898).

GOLUNGO ALTO.—A small tree, 10 ft. high ; branches spreading horizontally ; leaves larger than in the last species, sometimes nearly a foot long. In the elevated shady primitive forests of Cungulungulo, intermixed with the last species ; altitude about 2000 ft. ; young fr. Feb. 1855. No. **3182.**

CAZENGO.—A tree of 10 ft. ; trunk 4 in. in diameter at the base. In the elevated forests of Mount Muxâulo, on the left bank of the river Luinha, abundant and quite certainly indigenous ; young fr. 25 and 26 Dec. 1854. No. **3181.**

3. **C. melanocarpa** Welw. ex Hiern in Trans. Linn. Soc., Ser. 2, i. p. 173, and in Oliv., *l.c.*, p. 183 ; Ficalho, *l.c.*, p. 205.

GOLUNGO ALTO.—A shrub 4 to 6 ft., or occasionally a little tree of the same height ; leaves almost membranous ; berries quite black, not red-purple when ripe as is the case with *C. arabica*. In the less dense forests of Sobato de Bango Aquitamba and Bumba, as for instance, at the river Delamboa, not uncommon ; fr. Nov. and Dec. 1855. No. **3177.** A small shrub ; leaves evergreen ; flowers not yet seen. In forests near Sange, in company with *Dichrostachys platycarpa*, sporadic ; 2 Feb. 1855. The flower-buds are peculiar for having the calyx so thin transparent brittle and glossy that it looks like glass, and the buds seem to lie in the axils like drops of water ; this peculiarity is retained for some time even after the specimens have been dried for the herbarium. No. **3179.** Fl. and young fr. No. **3180.** Sange ; July 1855. The whole fruits dried by artificial heat to preserve their black colour. COLL. CARP. 650. A little tree, quite like in habit to *C. arabica* ; berries black, tinged black-purple ; testa of the seeds very

loosely investing the cotyledons, quite smooth. In moist forests, often in company with *C. arabica*, at the banks of the river Delamboa; ripe fr. July 1855. Coll. Carp. 651. Mata de Cacarambola; seeds August 1855. Coll. Carp. 652. Berries didymous-round, black-purple. In forests near Morro de Cacarambola, in company with palms: seeds July 1855. Coll. Carp. 653.

Cazengo.—Berries when ripe as large as a good-sized pea, somewhat didymous, very black with a very slight redness, 1 or 2-seeded; near the river Delamboa; nearly ripe fr. June 1856. Also in Golungo Alto. No. **3178**.

4. **C. hypoglauca** Welw. ex Hiern in Trans. Linn. Soc., Ser. 2, i. p. 173, and in Oliv. Fl. Trop. Afr. iii. p. 183; Ficalho, *l.c.*, p. 205.

Pungo Andongo.—A small tree, 15 to 20 ft. high; head lax; branches quite patent; leaves thinly coriaceous, shining, glaucous beneath. In wooded situations near Catete, Baranco grande in Sobato de Catete; unripe fr. Dec. 1856. No. **3174**. A tree of 15 ft. or more, with the habit precisely of *C. arabica*; trunk 2½ ft. (?) in diameter at the base; branches patent; leaves few-nerved and glaucous beneath; unripe berries green, as large as a small-sized pea. In shady forests between Catete and Pedra Pungo; unripe fr. Feb. 1857. No. **3175**. A small tree, 8 ft. high, with the habit of *C. arabica*; trunk straight, slender; berry 2-celled and 2-seeded or in some cases 1-celled and 1-seeded the septum and the second seed being abortive; seeds furrowed on the face (or according to Welwitsch flat and without a furrow on the face in the case of a nearly ripe fruit). In wooded places near Catete at the river Tangue, wild; nearly ripe fr. May 1857. No. **3176**.

5. **C. jasminoides** Welw. ex Hiern in Trans. Linn. Soc., ser. 2, i. p. 175, and in Oliv. Fl. Trop. Afr. iii. p. 185; Ficalho, *l.c.*, p. 205.

Golungo Alto.—A sarmentose twisted shrub; flowers precocious, snow-white, subpendulous, very sweetly fragrant. In very shady forests on the right-hand side of the road leading from Ponte de Luiz Simões, towards Camilungo; with leaves without fl., and fl. without leaves, Dec. 1854. No. **3169**. Ponte do Felix Simões, Camilungo; with leaves and fr. beginning of June 1856. No. **3170**. Flowers white, a little purplish, very fragrant; corolla hexamerous and pentamerous. Ponte de Felix Simões; fl. without foliage, Jan. 1855. No. **3171**. A shrub, 3 to 5 ft. high, erect but with the branches more or less sarmentose, leafless at the time of flowering, very much branched; branches decussate, spreading horizontally; habit of a *Jasminum*, which it resembles also in the shape and the very pleasant fragrance of its flowers; calyx relatively small, completely hidden by bracts, investing the ovary, urceolate; the limb erect, crenate-lobed; the lobes 7 or 8, short, broad, rather rigidly membranous, rounded-obtuse at the apex; corolla funnel-shaped, salver-shaped, white, usually rosy-red outside; the tube slender, sub-cylindrical, equal, about an inch long, naked inside; the limb spreading, 6- or 7- or very rarely 5-partite; the segments oblong, rather obtuse, erect-patent; stamens equal in number to the corolla-lobes or very rarely 8, inserted a little below the throat of the corolla, included; anthers incumbent but erect on account of the shortness of the filaments, attached by the middle to the very short filaments; style deeply bifid at the apex, with spreading thick lanceolate-spathulate obtuse lobes stigmatose on the inner side. In the densest thickets of forests, with its ultimate branches quasi-scandent among neighbouring shrubs, near Camilungo

on the left-hand side of the Ambaca road; fl. end of Oct. 1855. A shrub very well worth cultivating for the sake of the elegance and fragrance of its flowers. No. **2572**. A subscandent shrub. In wooded thickets near Bango; fr. No. **3172**. Calyx hidden by surrounding scales, adnate to the base of the petiole. In dense forests on the northern slopes of Serra de Alto Queta; few nearly ripe fr. end of Nov. 1855. Differing from the common form of the species by its leaves being rather more coriaceous, apparently mostly verticillate in fours, and occasionally rounded at the apex. No. **3173**.

37. **RUTIDEA** DC.; Benth. & Hook. f. Gen. Pl. ii. p. 116.

1. **R. Smithii** Hiern in Oliv. Fl. Trop. Afr. iii. p. 189.

Var. **Welwitschii** Elliot in Journ. Linn. Soc. xxx. p. 82 (1894).

Golungo Alto.—A shrub 4 to 6 ft.; branches sarmentose, quite patent, slender, flagelliform-elongated, twisted, flexuous, almost scandent, sustained by other shrubs; pith jointed in the manner of a Conferva; leaves rigidly chartaceous, deciduous; flowers white, slightly fragrant; calyx bracteolate at the base, campanulate, crowned with 5 obtuse erect teeth; corolla white, salver-shaped; the limb 5-cleft, reflexed, beset at the throat on the upper part of the tube inside with whitish erect-spreading pilose hairs; stamens 5, inserted at the throat, exserted by the turning back of the corolla-limb; anthers linear, acuminate, 2-celled, dehiscing longitudinally, dorsifixed; disk cupuliform, rather high; ovary included in the calyx; style filiform, central, far exserted, beset on the lower included part with thin hairs, thickly clavate towards the apex, split and stigmatose at the apex; berries orange-scarlet, as large as a peppercorn or a very small pea. In dense thickets and rather dense forests from Sange to the streams Cate and Casaballa and in hilly situations on the right bank of the river Delamboa, abundant: fl.-bud from the beginning of Nov. 1854 to 5 Jan. 1855, constantly in the same condition, and May 1855; fl. Oct. and Nov. 1855; fr. Sept. and Oct. 1854. No. **3168**.

2. **R. hirsuta** Hiern, sp. n.

A slender shrub, climbing far and high, with the habit of an *Ophiorrhiza*; stems weak, sub-terete, pallid, glabrate below, hirsute above with spreading or deflexed somewhat tawny hairs; leaves thinly coriaceous or sub-membranous, rather rigid, opposite, oval or sub-elliptical, rounded obtuse or narrowed and apiculate at the apex, rounded or subcordate and unequal at the base, bright green on both faces, glabrate except along the narrowly depressed midrib above and except the raised midrib and the 6 or 7 lateral veins on each side of it beneath, 3 to 6 in. long by $1\frac{1}{2}$ to 3 in. broad; petiole $\frac{1}{5}$ to $\frac{2}{5}$ in. long, hirsute; stipules supra-petiolar, with a prolonged subulate hirsute apex from a short broad base, $\frac{1}{4}$ to $\frac{1}{2}$ in. long; flowers $\frac{1}{2}$ to 1 in. long, greenish with the corolla-limb more deeply green-yellowish inside, sessile, a few together arranged in small bracteolate heads arranged in brachiate or subspicate pyramidal terminal bracteate cymes 2 to 3 in. long on a common peduncle of about the same length; bracts sub-acicular and hirsute or sometimes sub-foliaceous; bracteoles sub-acicular, smaller, hirsute; calyx $\frac{1}{5}$ in. long, hirsute outside, at the base with 2 subacicular bracteoles of $\frac{3}{5}$ in. in length; the tube funnel-shaped, small; the limb deeply 5-partite, $\frac{1}{10}$ to $\frac{1}{8}$ in. long, hirsute

outside, glabrous inside, ciliate, with lanceolate-linear sub-acicular segments; corolla-tube slender, $\frac{3}{8}$ to $\frac{3}{4}$ in. long, thinly hairy outside, glabrous inside; the limb deeply 5-cleft, spreading; the lobes lanceolate or ovate, pointed, $\frac{1}{6}$ in. long; anthers 5, inserted near the middle of their backs on shorter filaments about the throat of the corolla, alternating with its lobes, $\frac{1}{12}$ to $\frac{1}{10}$ in. long, linear-oblong, glabrous, erect, half exserted; disk narrow, fleshy, glabrous, annular; ovary 2-celled; cells 1-ovuled; ovules on fleshy placentas; style glabrous, slender, reaching nearly as high as the anthers, narrowly clavate and stigmatose towards the entire apex; berries globose, $\frac{1}{4}$ in. diameter or rather larger, rather dry, glabrous, crowned with the persistent hirsute erect calyx-limb, 1-celled, 1-seeded; seed globose, about $\frac{1}{5}$ in. diameter; albumen deeply ruminated.

Pungo Andongo.—By thickets along streams near Cazella within the præsidium, rather sparingly; fl. and fr. Dec. 1856. No. **3166**. In similar places; fl. middle of Nov. 1856, rather rare. A form with the corolla-tube abbreviated, $\frac{3}{8}$ in. long (half as long as in the previous No.). No. **3167**.

38. **MORINDA** L.; Benth. & Hook. f. Gen. Pl. ii. p. 117.

1. **M. citrifolia** L. Sp. Pl., edit. 1, p. 176 (1753); Hiern in Oliv. Fl. Trop. Afr. iii. p. 191.

Var. **lucida** Benth. in Hook. Niger Fl. p. 406 (1849) (sp.).

Barra do Bengo.—A small tree in the form of a bush with branches hanging down and with white flowers. In palm-groves by the river Bengo, near Santo Antonio; fl. and young fr. Dec. 1853. No. **4755**.

Golungo Alto.—A beautiful leafy tree, 15 to 20 ft. high, remarkable for the peculiar lustre of its foliage and the abundance of its white fragrant flowers; trunk a foot in diameter at the base; branches spreading; branchlets nodding-ascending; leaves coriaceous. At the borders of palm-groves along the banks of the river Delamboa, rather rare; fl. and young fr. May 1855. No. **4754**. A small tree. Compare also with the next species. Coll. Carp. 658.

Prince's Island.—A small tree, apparently evergreen; branches patent, red; branchlets and leaves bright-green; flowers whitish, fleshy. In forests about Pico Papagaio; fr. Sept. 1853. Native name "Guigo." No. **4756**.

According to a note of Welwitsch, the name of this tree in Golungo Alto is "N-golo-mugi," and its trunk reaches the size of $2\frac{1}{2}$ to 3 ft. in diameter, especially in the virgin forests of Capopa; the timber is generally used by the negroes for the building of their huts.

2. **M. longiflora** G. Don, Gen. Syst. iii. p. 545 (1834); Hiern, *l.c.*

Golungo Alto.—A subscandent evergreen shrub; leaves and flowers more or less fleshy; flowers completely herbaceous-green except the internal face of the corolla-lobes which is snow-white. Near Ponte de Felix Simões, sparingly; fl. Nov. 1854. No. **4757**. A shrub, sometimes prostrate with the flowering branchlets ascending, in other cases climbing with the branches and branchlets hanging down: flowers hexamerous, very sweetly fragrant, scented like jessamine; calyces concrete at the base, diverging in a radiating manner from one

centre ; the limb cupuliform, truncate, fleshy, hard, loosely surrounding the corolla-tube, herbaceous-green ; corolla resembling a jessamine in shape as well as fragrance, fleshy, rigid, herbaceous-green outside ; the lobes snow-white inside, spreading in a stellate manner during the time of flowering, at length reflexed ; fruit rather dry, the syncarpium an inch in diameter. At the borders of forests close to the river Delamboa ; fl. Jan. 1855 ; also by the Ambaca road at Camilungo ; fr. Sept. 1855. No. **4758**. An evergreen climbing shrub with white fragrant flowers ; at Sange, fr. August 1855. Coll. Carp. 656. An evergreen climbing shrub ; flowers very fragrant with an aroma like that of a jessamine. In wooded situations near Sange ; fr. July 1857. Coll. Carp. 657. These specimens from the carpological collection must also be compared with the previous species.

39. **MYRSTIPHYLLUM** P. Browne, Hist. Jam. p. 152 (1756).

Psychotrophum P. Browne, *l.c.*, p. 160, pro parte, t. 17, f. 2. *Psychotria* L. Syst. Nat., edit. 10, ii. p. 929 (1759) ; Benth. & Hook. f. Gen. Pl. ii. p. 123, excl. syn. part. *Myrstiphyllon* Adans. Fam. Pl. ii. p. 505 (1763). *Chasallia* vel *Chassalia* Comm. ex Poir. in Dict. Sc. Nat. viii. p. 198 (1817). *Chasalia* DC. Prodr. iv. p. 531 (1830) ; Benth. & Hook. f., *l.c.*, p. 126.

1. **M. cristatum.**

Psychotria cristata Hiern in Oliv. Fl. Trop. Afr. p. 205.

Golungo Alto.—A shrub, rather an undershrub and tortuously sarmentose on the ground with erect branches when growing in very shady situations, but in open and less shady places climbing on trees though to no great height ; leaves fleshy-coriaceous, brittle, very glossy above ; flowers white ; pedicels fleshy, ventricosely jointed, pale-rosy ; calyx green ; corolla pentamerous, the tube gibbous, fleshy ; the throat naked ; the lobes induplicate-angular towards the apex ; anthers 5, deep-violet in colour, at length exserted in consequence of the turning back of the corolla-limb which is spotted with yellow inside ; filaments inserted at the middle of the corolla-tube ; style 1, terminating in a bifurcate stigma ; the lobes rather thick, yellowish, subspathulate. In forests and their densely bushy outskirts, amongst the eastern mountains of Queta, Jipepe ; not yet in full fl. end of Dec. 1855. No. **3200**. A shrub climbing widely but not high ; berries of a green-violet colour when not quite ripe. In thickets near Banza in Sobato Bumba, rather rare ; fr. July 1855. No. **3201**. A low prostrate shrub ; flowering branchlets ascending ; flowers cymose, milk-white ; peduncles rosy, fleshy ; berries turning black-blue, as large as a good-sized pea, apparently 2-seeded. Capopa ; fr. April 1856. Coll. Carp. 645.

2. **M. nigropunctatum.**

Psychotria nigropunctata Hiern in Oliv. Fl. Trop. Afr. iii. p. 207.

Pungo Andongo.—A low little shrub ; stem ascending ; leaves subcoriaceous, rather glossy ; flowers whitish. In very shady parts of Mata de Pungo, sparingly ; fl. Dec. 1856, No. **3195**. Our specimens differ a little from the type by the extremities of the stem and lower face of the leaves being minutely puberulous, etc.

3. **M. reptans.**

Psychotria reptans Benth. in Hook. Niger Fl. p. 418 (1849) ; Hiern, *l.c.*, p. 211.

GOLUNGO ALTO.—An evergreen shrub, 2 to 3 ft. high ; leaves glossy above ; flowers white, dimorphic ; corolla-lobes valvate in the bud, induplicate at the apex, with little horns proceeding from their folds. In dense mountainous forests, especially by streams near Fonte de Capopa, about Sange ; fl. 1 Dec. 1854. No. **3204**. A shrub of 2 to 4 ft.; branches rather erect, the fresh branchlets marked with two longitudinal lines of hairs and a little compressed below the internodes ; leaves subcoriaceous, black-green and very glossy above, pallid beneath ; corolla white, pentamerous, tubular ; the limb 5-cleft, recurved-spreading at the time of full flower ; the throat bearded : stamens 5, inserted at the throat, exserted ; filaments bearded at the base ; anthers cordate, white, introrsely 2-celled, longitudinally dehiscing ; ovary three-quarters covered by the quinquedentate calyx ; style filiform, bilobed at the apex ; the lobes more or less spathulate, rather thick, stigmatose inside, sub-exserted. On slopes at the outskirts of forests on the left bank of the river Cuango ; fl. 5 June 1855. No. **3205**. A form with denser inflorescence. No. **3205***b*. A shrub, 1½ to 2 ft. high ; branches bent, very slender ; berries red-vermilion. 2-seeded ; seeds depresso-hemispherical. In dense forests among the mountains of Queta as far as Ondêla, sporadic ; fr. June 1855. No. **3206**.

PUNGO ANDONGO.—In thickets between Candumba and Lombe ; fl. March 1857. No. **3207**.

4. **M. macrodiscus.**

Chasalia macrodiscus K. Schum. in Engl. Bot. Jahrb. xxiii. p. 469 (1897).

PUNGO ANDONGO.—A climbing shrub ; leaves coriaceous, deep-green, paler beneath ; corolla from whitish to flesh-colour, with a curved tube ; stamens placed together in one part of the corolla-tube during the time of full flower, the opposite part of the tube being occupied solely by the style. By rocky thickets in the fortress, rather rare ; fl., middle of Nov. 1856. No. **3198**. A widely scandent shrub, with purple flowers. By thickets on the western side of the præsidium ; fl. Jan. 1857. No. **3199**.

This species is dimorphic, the anthers being only half exserted with the style long and exserted in the first No., and the anthers wholly exserted with the style short and included in the second No. ; it is referred with some doubt to the name above, which belongs to a Gaboon plant collected by Soyaux, n. 212 ; I have not seen a type specimen of it ; our specimens agree fairly well with the description as quoted, but the leaves do not exceed 5 in. long by 2¼ in. broad, the petioles range only up to ⅔ in. long, and the absence of fruit renders it impossible to compare the size of the disk at the apex.

40. **GRUMILEA** Gaertn. Fruct. i., p. 138, t. 28, f. 2 (1788). *Psychotria* Benth. & Hook. f. Gen. Pl. ii. p. 123 pro parte, non L.

1. **G. catetensis** Hiern, sp. n.

A small glabrous rather glossy tree ; branches sub-terete, dichotomous, the ultimate ones subscandent, somewhat compressed towards the extremities, leafy ; leaves opposite, elliptical or oblanceolate, pointed or subacuminate at the apex, narrowed or wedge-shaped at the base, tough, papery-coriaceous, green on both faces, the young ones turning dark in colour when dry, ranging up to 8 in. long by 3 in. broad ; margins narrowly revolute ; lateral veins about nine on each side of the midrib, slender,

patent, raised beneath; petioles ranging up to $1\frac{1}{4}$ in. long; stipules ovate, acute, connate at base, undivided, $\frac{1}{4}$ in. long; flowers pentamerous, greenish, about $\frac{1}{8}$ in. long when expanded, on short puberulous pedicels arranged in compound umbellate shortly pedunculate or sessile puberulous terminal cymes 2 to 3 in. in diameter; common peduncles ranging up to $\frac{1}{2}$ in. long; calyx $\frac{1}{15}$ in. long, puberulous outside; the limb cupuliform, 5-cleft; the lobes deltoid, glabrous inside; corolla nearly glabrous outside; the tube about $\frac{1}{12}$ in. long, straight; the throat densely bearded; the lobes about $\frac{1}{8}$ in. long, oval, pointed, valvate in the bud, induplicately so at the apex, spreading or reflexed in open flower; stamens 5, inserted at the throat of the corolla; glabrous; anthers ellipsoidal-oblong, exserted, shorter than the filaments, $\frac{1}{24}$ in. long: disk fleshy, glabrous, prominent, comparatively large; style glabrous below, not exserted, about reaching the throat of the corolla; stigma bilobed; ovary small, fleshy, 2-celled, sub-turbinate, somewhat compressed; cells 1-ovuled; ovules erect; fruit pea-shaped, $\frac{1}{4}$ in. in diameter, glabrate, 1-celled; seed solitary; albumen apparently ruminated.

PUNGO ANDONGO.—In dense forests by streams near Catete; fl. and young fr. Dec. 1856. No. **3208**.

2. **G. flaviflora** Hiern, sp. n.

An undershrub, 12 to 15 in. high, as the upgrowth from a woody rootstock, or probably growing taller; stems several, erect or ascending, not much branched, pubescent or puberulous with whitish short hairs and somewhat angular except the base, compressed toward the apex; middle internodes distant; leaves opposite, obovate, rounded or retuse and sometimes mucronulate at the apex, wedge-shaped towards the base, thinly coriaceous, shining, deep-green and sparingly scattered with short hairs above, paler and subscabrid with short hairs along the midrib and venation beneath, ranging up to 4 in. long by $2\frac{1}{2}$ in. broad; lateral veins about 6 to 8 on each side of the midrib, slender but clearly marked as well as the reticulation beneath; petioles ranging up to $\frac{1}{2}$ in. long; stipules deltoid, pointed, undivided, connate at the base, hairy at the back; flowers turning yellow, about $\frac{1}{4}$ to $\frac{3}{10}$ in. long when expanded, sessile or subsessile, several together in little dense clusters arranged in brachiately branched hemispherical-corymbose pedunculate hairy terminal cymes about 2 in. in diameter; common peduncle nearly 3 in. long, compressed, pubescent, with 2 caudate bracts at the apex; bracteoles small, some caudate; calyx about $\frac{1}{12}$ in. long, pubescent outside; the limb cupuliform, 4 to 5-cleft, glabrous inside, lobes deltoid; corolla rather fleshy, $\frac{1}{5}$ or $\frac{1}{4}$ in. long when expanded; the tube cylindrical, straight or nearly so, nearly glabrous outside; throat densely bearded; limb spreading; lobes 4 or 5, ovate, obtuse, $\frac{1}{12}$ to $\frac{1}{10}$ in. long, valvate in the bud, induplicately so and hooded at the apex; stamens 4 or 5, more or less shortly exserted, minutely hairy; anthers oblong, about equalling the filaments which are inserted on the

corolla throat; disk fleshy, cushion-shaped, glabrous; ovary 2-celled; cells 1-ovuled; ovules erect or ascending; style glabrous at base, minutely puberulous upwards, dilated towards the bilobed stigma, often a little curved; lobes of the stigma glabrous inside.

PUNGO ANDONGO.—Between Cazella and Luxillo; fl. Jan. 1857. No. **3194**.

3. **G. moninensis** Hiern, sp. n.

An undershrub, about 18 in. high, often flowering at the top of shoots of 9 to 12 in. high which arise after periodical burnings; stems sub-terete below, pallid or reddish, glabrate below, puberulous above; branches patent, densely puberulous towards the extremities with pallid short thick hairs, leafy; leaves opposite, obovate or oblanceolate, usually obtuse or rounded at the apiculate apex, wedge-shaped to the sessile or subsessile base, thinly and firmly coriaceous, deep-green and nearly glabrous above, whitish and squamulose-tomentellous beneath except the reddish venation, $1\frac{1}{3}$ to 4 in. long by $\frac{2}{3}$ to 2 in. broad; lateral veins about 10 on each side of the midrib, starting at about 45° with the midrib, clearly marked by difference of colour beneath; stipules broadly ovate, bipartite; flowers white, about $\frac{1}{8}$ in. long when expanded, $\frac{1}{5}$ in. long before expansion, subsessile, clustered several together in little heads bracteolate at the base, arranged in compound dense pedunculate nearly glabrous terminal cymes 1 to $1\frac{1}{2}$ in. in diameter; bracteoles small, ovate; common peduncle about 1 in. long; calyx $\frac{1}{12}$ in. long, glabrous or nearly so; the limb cupuliform, 5-cleft; the lobes deltoid, loosely surrounding the corolla-tube; corolla white, rather fleshy, the tube funnel-shaped, short, straight, glabrous outside; the throat densely bearded; the lobes 5, ovate, nearly $\frac{1}{8}$ in. long, valvate in the bud, induplicately so at the apex, spreading in full flower, nearly glabrous outside, faintly squamulose-puberulous inside; stamens 5, glabrous; anthers linear-oblong, exserted, dorsifixed; filaments nearly as long as the anthers, inserted at the throat; ovary 2-celled; cells 1-ovuled; ovules ascending, sub-orbicular, compressed; disk glabrous, fleshy-annular; style glabrous, about $\frac{1}{8}$ in. long, rather thick and a little curved; stigma thickly clavate, 2- or rarely 3-lobed; fruit rather dry, subglobose, $\frac{1}{5}$ in. in diameter; seed $\frac{1}{8}$ in. in diameter; testa intruded.

HUILLA.—In the wooded thickets of Monino; fl. and fr. beginning of April 1860. No. **3192**.

4. **G. Welwitschii** Hiern, sp. n.

A robust little shrub, a foot high; stems simple or a little branched, sub-terete glabrate and bare below, somewhat compressed puberulous and leafy towards the top; leaves opposite, ovate, rounded obtuse or shortly pointed and often apiculate at the apex, rounded obtuse or shortly narrowed at the base, chartaceous, glabrous above or nearly so, usually scattered with very short hairs especially along the principal veins and margin beneath,

pallid-green on both faces, slightly paler beneath, 3 to 5 in. long by 2 to 3 in. broad; lateral veins 10 to 12 on each side of the midrib, inconspicuous; petioles $\frac{1}{2}$ to 1 in. long; stipules ovate, acute, bidentate, puberulous at the back, $\frac{1}{3}$ in. long, deciduous; flowers pentamerous, white, $\frac{1}{5}$ in. long when expanded, on short puberulous pedicels, several together in little clusters arranged in umbelliform or pyramidal-corymbose compound pedunculate terminal cymes 1 to $1\frac{1}{2}$ in. in diameter; bracts and bracteoles small or obsolete; common peduncle $1\frac{1}{2}$ to 2 in. long, rather slender, puberulous; calyx campanulate-hemispherical, somewhat compressed, $\frac{1}{15}$ in. long, minutely puberulous outside; the limb shorter than the ovary, with 5 broadly ovate lobes, glabrous inside or very nearly so; corolla minutely pubescent outside; the tube $\frac{1}{5}$ in. long, straight, glabrous inside except 5 patches of whitish hairs about the top making the throat densely hairy; lobes oval-oblong, equalling the tube, puberulous inside, reflexed in open flower; stamens 5, glabrous; anthers ellipsoidal-oblong, exserted; filaments longer than the anthers, inserted about the throat of the corolla; disk fleshy, elevated, glabrous; ovary fleshy, 2-celled; cells 1-ovulate; ovules oval, compressed, erect; style glabrous, straight, bilobed at the stigma, equalling the corolla-tube.

HUILLA.—In the more open forests of Monino; fl. Jan. 1860. No. **3193**.

5. **G. subsuccosa** Hiern, sp. n.

A small tree, often a robust shrub of 3 or 4 ft. in height but then perhaps only young, glabrous nearly throughout; branches sub-terete; branchlets somewhat compressed towards the extremities; leaves opposite oval or somewhat obovate, cuspidate at the apex, more or less wedge-shaped, sometimes very shortly so towards the base, thinly and dryly coriaceous, glossy, rather rigid in the living state, deep-green above, paler beneath, 4 to $7\frac{1}{2}$ in. long by 2 to 4 in. broad; lateral veins 9 to 13 on each side of the midrib, slender, spreading at a wide angle, pale beneath; petioles $\frac{1}{3}$ to $\frac{1}{2}$ in. long; stipules broadly ovate, pointed or acute, bidentate at the tip, $\frac{1}{4}$ to $\frac{1}{3}$ in. long, puberulous at the back, deciduous; flowers pentamerous, about $\frac{1}{8}$ in. long, on very short puberulous pedicels or subsessile several together, arranged in branched compound sub-umbelliferous terminal pedunculate minutely puberulous cymes 2 to 3 in. in diameter; common peduncle about $\frac{1}{2}$ in. long; bracteoles small, subulate from a broad base, puberulous at the back, deciduous; calyx broadly campanulate, about $\frac{1}{15}$ in. long, green, puberulous outside; the limb about as long as the ovary, glabrous inside, 5-cleft; the lobes broadly ovate, apiculate; corolla glabrous or nearly so, about $\frac{1}{12}$ in. long when expanded, campanulate, rather fleshy, whitish-yellow, 5-cleft half way down; the throat densely bearded; the lobes oval, hooded-apiculate at the apex, about as long as the tube, valvate in the bud, indupli-cately so at the apex, reflexed at the time of the open flower;

stamens 5, glabrous; anthers ellipsoidal-oblong, shortly exserted; filaments inserted about the corolla-throat, shorter than the anthers and attached to them near their base at the back; disk fleshy, elevated, glabrous; ovary 2-celled, fleshy: cells 1-ovuled; ovules broadly ovoid, erect; style glabrous, $\frac{1}{15}$ in. long, exserted, a little curved, compressed, sub-linear, slightly widened upwards to the bifid stigma at the apex; the lobes diverging, short, ovate; fruit baccate, pea-shaped, brilliantly scarlet, juicy-pulpy, $\frac{1}{5}$ to $\frac{1}{3}$ in. in diameter, glabrous, 1- or 2-seeded; seeds about $\frac{1}{6}$ in. in diameter; testa somewhat intruded into the albumen.

Golungo Alto.—On the left bank of the river Cuango near Cacarambola; fl. beginning of Dec 1855. No. **3209**. In shady forests and on their outskirts in Sobato de Mussengue, near Menha Lula; fl. beginning of August 1855; by the river Delamboa, ripe seeds Nov. 1855. No. **3210**. A small tree; Delamboa. Branches sub-terete; panicle 1 to 2 in. in diameter, terminal, ebracteolate; fr. $\frac{1}{4}$ in. in diameter. Perhaps a distinct species. No. **3202**.

Nearly related to *G. venosa* Hiern and *G. micrantha* Hiern.

41. **GEOPHILA** D. Don; Benth. & Hook. f. Gen. Pl. ii. p. 127.

1. **G. reniformis** D. Don, Prodr. Fl. Nepal. p. 136 (1825); Hiern in Oliv. Fl. Trop. Afr. iii. p. 220.

Pungo Andongo.—No notes. Without either fl. or fr. Doubtfully referred to this species. No. **3212**.

2. **G. unifiora** Hiern, *l.c.*, p. 221.

Cazengo.—A perennial creeping stoloniferous herb; leaves rounded at the apex, not acuminate; corolla white, rather fleshy, 5-cleft, readily deciduous; the tube cylindrical, $\frac{2}{5}$ in. long; the lobes puberulous outside, $\frac{1}{6}$ in. long. In very shady damp rocky places, by the cataracts of the river of Muxâula among the Muxâula mountains, very rarely flowering; only one fl. Dec. 1854. Either this or a closely allied species; the leaves $\frac{1}{2}$ to 1 in. in diameter are rather smaller than in the type. No. **3211**.

3. **G. Afzelii** Hiern, *l.c.*

Prince's Island.—Pico do Papagaio, in the mountainous region: without either fl. or fr. Sept. 1853. Apparently this species. No. **3213**.

42. **OURAGOGA** L. Hort. Cliff. p. 486 (1737), and in Diss. de Viola Ipecacuanha, p. 5 (16 Dec. 1774).

Uragoga L. Gen. Pl. edit. 1, p. 378 (1737). *Cephaëlis* Swartz (1788); Benth. & Hook. f. Gen. Pl. ii. p. 127.

1. **O. peduncularis** K. Schum. in Engl. & Prantl, Nat. Pflanzenfam. iv. 4. p. 120 (1891) (*Uragoga*).

Cephaëlis peduncularis Salisb. Parad. Londin. n. 99 (1808); Hiern in Oliv. Fl. Trop. Afr. iii. p. 223.

Pungo Andongo.—An erect, much-branched shrub, 4 to 5 ft. high, with glossy deep-green leaves. In sandy thickets by the river Cuanza, near Candumba; fl. Jan. 1857. No. **3196**. In shrubby places at the outskirts of forests near Candumba; fr. March 1857. No. **3197**.

Our specimens belong to a form of this variable species with smaller, narrower, and more acuminate foliage than in the typical form.

43. **OTIOPHORA** Zuccar. ; Benth. & Hook. f. Gen. Pl. ii. p. 137.

1. **O. scabra** Zuccar. in Abh. Akad. Muench. i. p. 316 (1832).

Huilla.—An erect herb, 2 to 3 ft. high ; stems and branches numerous, erect or ascending, sub-cylindrical below, sub-compressed above ; branches and leaves hairy, opposite, the latter at the same time with other leaves fasciculate in their axils, lanceolate, deep-green above, turning pallid beneath, with raised venation ; stipules connecting the petioles, 4- to 6-setose ; flowers cymulose-paniculate or corymbose, white, scarcely bracteolate ; calyx-tube adhering to the ovary, the limb 5-cleft, the segments very unequal, one much larger than the rest and foliaceous, erect, persistent ; corolla salver-shaped, milk-white ; the tube straight, but little dilated towards the throat, hairy inside ; the limb-segments 5, ovate, spreading in a stellate manner ; the throat very densely bearded with white hairs ; stamens 5, inserted below the corolla-throat, included ; anthers straight, linear, concealed amongst the hairs of the beard of the corolla-throat ; ovary inferior, sub-compressed, 2-celled, crowned with a thin disk ; ovules solitary in the cells, rather fleshy ; style filiform, exserted ; stigma bilobed ; the lobes spreading horizontally, oblong, turning fuscous ; capsule turbinate, somewhat compressed, topped by the calyx-teeth, 2-celled, bluntly beaked in the centre of the apex. In the drier thickets near Lopollo and around the lake of Ivantâla in wooded situations in the direction of Quilengues, abundant ; fl. and young fr. March 1860. No. **5329**. A herb, suffrutescent at the base, scarcely 2 ft. high, branched from the base, stems angular, pilose, atro-purpureous, patently branched ; flowers azure-blue, sessile, arranged in terminal spikes ; calyx investing the ovary ; the limb 5-cleft, 4 of them very small, ciliolate-glandular, the fifth much larger, foliaceous ; corolla-tube long, slender ; the limb-segments 5, valvate in the bud, reflexed in the open flower ; stamens 5, exserted, on long filaments ; style filiform, deeply bifid or rather divided into 2 elongated linear-clavate stigmas. In sandy thickets about Lopollo and Humpata ; fl. Dec. 1859 ; fr. Jan. 1860. No. **5330**. At Ferrão da Sola ; fl. and fr. beginning of April 1860. No. **5331**. At Humpata ; fl. and fr. end of Jan. 1860. No. **5336**.

The flowers are dimorphic ; our specimens are not quite so pubescent or scabrid on the branchlets as in the type, and they are sometimes bifariously hairy on the branches.

44. **ANTHOSPERMUM** L. ; Benth. & Hook. f. Gen. Pl. ii. p. 140.

1. **A. pachyrrhizum** Hiern in Oliv. Fl. Trop. Afr. iii. p. 229.

A. hirsutum A. Rich. Fl. Abyss. i. p. 346 (1847), non DC. ; Engl. Hochgebirgsfl. p. 401 (1892).

Huilla.—A herb ; root thick, succulent, whitish, rather fleshy, 4 to 7 in. long ; leaves rigid, patent ; flowers pentamerous, rarely hexamerous, axillary, clustered ; corolla campanulate, whitish-yellow ; the lobes of the limb ovate, acuminate. On plains and in neglected fields, near Lopollo, abundant ; female fl. and fr. Nov. and Dec. 1859. No. **5338**. At Lopollo ; fl. and fr. Dec. 1859. No. **5337**.

Engler, *loc. cit.*, retains A. Richard's name of this species, and thereby implicitly rejects that of De Candolle ; the latter name, however, properly stands for the plant so named and characterized by Cruse, Rub. Cap. p. 8 (1825).

2. **A. ternatum** Hiern, sp. n.

An erect fruticose herb, 1½ ft. high or more ; branches often

ternate, rather slender, usually virgate, somewhat woody subterete and sub-glabrate below, puberulous with very short dense thick whitish hairs on a reddish bark above; middle internodes about equalling the spreading leaves; upper internodes gradually shorter and not as long as the leaves; leaves verticillate 3 together or opposite, with very abbreviated leafy branchlets in the axils giving the leaves a fasciculate appearance, spathulate-linear or very narrowly so in consequence of the margins being broadly revolute towards the midrib, apiculate at the apex, narrowed gradually towards the sessile or sub-sessile base, glabrous or very nearly so, rigid, spreading, 1-nerved, $\frac{1}{3}$ to $1\frac{1}{3}$ in. long; stipules adnate to and uniting in a short sheath the leaf-bases or short petioles, truncate and uni-cuspidate or lanceolate-linear from a broad sub-truncate base, minutely puberulous outside, subpersistent; flowers apparently unisexual; female flowers tetramerous, sessile or sub-sessile; calyx-limb very small, with inconspicuous teeth; corolla salver-shaped, very small, sub-persistent; the tube slender, glabrous, about $\frac{1}{10}$ in. long; the lobes scattered with a few hairs at the back, oblong-lanceolate, obtuse, valvate in the bud, induplicately so at the apex, longer than the tube, reflexed in open flower; stamens 4, exserted, glabrous; anthers rather small, effete; filaments filiform, inserted about the mouth of the corolla-tube; style puberulous, shortly exserted, 2-lobed at the apex, filiform; fruit dicoccous, dry, puberulous, $\frac{1}{10}$ in. long. Male flowers unknown.

HUILLA.—In thin forests near Eme; female fl. and young fr. end of March and beginning of April 1860. No. **5339**. In the Panda forests about Eme; female fl. and ripe fr. end of April 1860. No. **5340**.

3. **A. Welwitschii** Hiern, sp. n.

A robust suffruticose herb; stem erect, reddish, glabrate, closely branched, 1 to 2 ft. high or more; branches spreading at an angle of about 45° with the stem, puberulous towards the extremities, densely leafy; leaves sub-linear or sub-spathulate, apiculate at the apex, narrowed gradually to the sub-sessile base, uni-nerved at the base, glabrous or very nearly so, minutely or obsoletely scaly especially beneath, rigid, opposite, with abbreviated leafy branchlets in the axils giving the leaves a fasciculate appearance, $\frac{1}{3}$ to $1\frac{1}{4}$ in. long, margins revolute; stipules truncate, 3- to 5-cuspidate, joining the very short petioles or leaf-bases; flowers sub-sessile, tetramerous, whitish, small; calyx-limb green, quadripartite; the segments lanceolate or subulate, shorter than the corolla-tube in the male flowers, glabrous; corolla of the male flowers funnel-shaped; the lobes lanceolate, twice as long as the tube, valvate in the bud, spreading in full flower; stamens 4, glabrous; anthers ellipsoidal-oblong; cells 2, separated at the base for some distance up to the point of attachment of the filament at the back; filaments slender, filamentous, inserted about the middle of the corolla-tube; style elongated, slender, puberulous, bifid at the apex.

HUILLA.—In wooded thickets of the Panda forests, near Eme; male fl. April 1860. No. **5335**.

45. **DIODIA** Gronov., L.; Benth. & Hook. f. Gen. Pl. ii. p. 143.

1. **D. maritima** Thonn. ex Schum. in Dansk. Vidensk. Selsk. iii. p. 95 (1828); Hiern in Oliv. Fl. Trop. Afr. iii. p. 231.

Loanda.—Rather fleshy throughout, glaucous-green, creeping a long distance half buried in the sand of the sea-shore, throwing out slender fibres from each node of the prostrate or creeping stem, growing quite after the fashion of *Arenaria peploides* L.; leaves beset with hyaline papillæ; flowers white; corolla segments narrowly ovate, rather obtuse and fleshy; the tube clothed near the bottom with rather long hairs; stamens falling short of the style; filaments filiform, not subulate; stigma peltate-capitate, somewhat sulcate-bilobed, white; fruit almost ventricose-cylindrical. In sandy maritime places between Penedo and Conceição, rather rare; half-ripe fr. and few fl., 25 May 1858. No. **3217**.

Barra de Dande.—A prostrate suffrutescent herb; leaves rough, rather rigid, bright-green in the living state. At Praia between the mouths of the rivers Dande and Bengo, sparingly and nearly always in company with *Ipomœa biloba* Forsk.; fl. and fr. Sept. 1858. No. **3216**.

Benguella.—Stems 6 to 8 ft. long, quadrangular, winged, purplish. In sandy maritime places near the city; fr. June 1859. No. **3218**.

2. **D. scandens** Swartz, Prodr. Ind. Occ. p. 30 (1788).

D. breviseta Benth. in Hook. Niger Fl. p. 424 (1849); Hiern, *l.c.*

Golungo Alto.—A suffruticose herb; stem branched from the base; branches long, sarmentose, climbing; leaves rigid, scarcely coriaceous; stipules with setaceous teeth. In forests among the mountains of Queta by the river Delamboa, very rare; fr. end of May and in June 1856. No. **3215**.

Pungo Andongo.—At Catete; a young plant in very young fl.-bud Dec. 1856. Very doubtfully referred here. No. **3251**.

3. **D. flavescens** Hiern, sp. n.

A scabrid-pubescent perennial herb; rootstock fleshy, woody, thick, 3 to 5 in. deep, 1 to 1½ in. in diameter, forming several heads; stems erect or ascending, simple or slightly branched near the base, 8 to 16 in. high, sub-glabrate or puberulous and scarcely angular below, scabrid-hirsute, lined and furrowed above, leafy with very short internodes towards the apex; internodes about equalling the leaves near the middle of the stems; leaves oval-oblong, apiculate at the scarcely acute apex, a little narrowed at the sessile or sub-sessile base, herbaceous, deep-green and roughly scabrid above, yellowish-green and hispidulous-scabrid beneath, ⅜ to 1⅛ in. long by ⅛ to ⅜ in. broad; margin rough, narrowly revolute; lateral veins about 3 on each side of the midrib, slender, making a small angle with the midrib, depressed on the upperside of the leaves; stipules adnate to the leaf-bases or short petioles, giving off several reddish setæ from a short truncate base, hairy outside, glabrous and shining inside; flowers axillary, pale-yellowish, ⅛ in. long exclusive of the exserted stamens and style, sessile or sub-sessile, a few or several together in small axillary bracteolate clusters; bracteoles lanceolate-subulate, shorter than the calyx, ciliolate; calyx ⅛ in. long, squamulose-puberulous; the

limb 4-partite; the segments ovate-lanceolate, ciliate, somewhat puberulous, $\frac{1}{12}$ in. long, nearly equal among themselves, more or less persistent, green; corolla funnel-shaped, $\frac{1}{10}$ in. long; the tube nearly glabrous; the lobes of the limb 4, somewhat puberulous inside, hairy near the tip outside, ovate, valvate in the bud, induplicate-hooded at the extreme tip, spreading or reflexed in open flower, $\frac{1}{12}$ in. long; the throat glabrous; stamens 4, exserted, $\frac{1}{15}$ in. long, sub-erect, straight; filaments about as long as the anthers, minutely puberulous: anthers linear-oblong; style exserted, rather exceeding the anthers, minutely puberulous; stigma papillose, sub-capitate; fruit dry, apparently indehiscent, puberulous, about $\frac{1}{10}$ in. long, besides the more or less persistent calyx-limb, 2-celled; cells 1-seeded; seeds fuscous, $\frac{1}{12}$ in. long.

Huilla.—In exposed thickets near Lopollo, occasional; fl. and fr. middle of Dec. 1859. No. **5318**. At Empalanca; fl. and fr. Feb. 1860. Foliage rather small. Probably a form of this species. No. **3214**.

4. **D. benguellensis** Hiern, sp. n.

A rough scabrous-hispid apparently annual herb, 4 to 8 in. high, erect, divaricately branched, pallid, somewhat woody at the base; root vertical, somewhat woody; stem branched from the base; branches sub-terete, marked with 4 raised lines, hispid-scabrous; leaves narrowly elliptical or linear-oblong, narrowed and apiculate at the apex, somewhat narrowed to the sessile base, rigid, hispid-scabrous, pale-green on both faces, still paler beneath, erect-patent, $\frac{1}{2}$ to $1\frac{1}{2}$ in. long by $\frac{1}{8}$ to $\frac{3}{8}$ in. broad; margins revolute, often widely so; lateral veins about 3 on each side of the midrib, not conspicuous, making a small angle with the midrib; stipules truncate, hairy at the back, glabrous inside, about 5-setose at the apex, adnate to the leaf-bases and so sheathing; the setæ pallid, longer than the sheath; flowers tetramerous, $\frac{1}{4}$ in. long, sessile, bracteolate, numerous, in sessile axillary and terminal heads $\frac{1}{3}$ to $\frac{1}{2}$ in. in diameter; bracteoles unequal, some equalling others shorter than the flowers; calyx $\frac{1}{6}$ in. long, the limb 4-partite, hairy outside, glabrous inside; the segments linear-lanceolate, ciliate; corolla glabrous, funnel-shaped; the tube about $\frac{1}{10}$ in. long, straight; the lobes about $\frac{1}{20}$ in. long, ovate, obtuse, valvate in the bud, with a filiform tail or tails at or near the apex; stamens 4, glabrous; filaments filiform, short, inserted about the top of the corolla-tube between the lobes of the limb; style about equalling the stamens, glabrous, filiform; stigma sub-capitate, sub-bilobed; fruit hispid outside on the upper part, crowned with the persistent calyx-limb, apparently indehiscent, 2-seeded; seeds $\frac{1}{8}$ in. long, deeply furrowed inside.

Bumbo.—In fields after a crop of *Arachis hypogæa*; fl. and fr. Oct. 1859. No. **3223**.

Huilla.—At Lopollo in Senhor Kneismann's kitchen garden; only one specimen, fl. end of March 1860. No. **3224**.

46. **TARDAVEL** Adans. Fam. Pl. ii. p. 145 (1763).

Borreria G. F. W. Meyer, Prim. Fl. Esseq. p. 79, t. 1 (1818); K. Schum. in Engl. & Prantl, Nat. Pflanzenfam., iv. 4, p. 143(1891). *Spermacoce* L. f.; Benth. & Hook. f. Gen. Pl. ii. p. 145, p.p.; non L.

1. **T. stricta.**

Spermacoce stricta L. f. Suppl. Pl. p. 120 (1781); Hiern in Oliv. Fl. Trop. Afr. iii. p. 236; non L. Herb. *Borreria stricta* DC. Prodr. iv. p. 561, non p. 541; K. Schum., *l.c.*; non Mey.

Pungo Andongo.—An erect herb, with purple stem and violet-coloured flowers. In moist pastures amongst dense herbage, near Muta Lucala, on the right bank of the river Cuanza; fl. and fr. March 1857. No. **3244**. An annual, erect, branched herb; stem and branches bright-purple; flowers white, turning bluish; corolla tetramerous, with the limb obtusely lobed. In moist grassy places by the river Cuanza, very abundant; fl. and fr. 1 May 1857. No. **3245**. An erect, annual, patently branched herb, with small yellowish flowers. In sandy wooded places between Bumba and Condo; fl. and fr. 15 March 1857. A small form. No. **3233**. In damp wooded places near Lombe; fr. March 1857. No. **3219**. An erect, branched, annual herb, 3 to 4 ft. high, with whitish-violet-coloured fugacious flowers. In herbaceous nearly dried up parts of the lake near Quibande; fr. March 1857. No. **3220**.

All these Nos. are doubtfully referred to this species, the type of which I have not seen. The two first Nos. are clothed with horny hairs on the upper part, and the last two have their stems smooth and their leaves also glabrous.

2. **T. huillensis** Hiern, sp. n.

An annual, erect or diffuse, much branched, hispid herb, 4 to 12 in. high; stems tetragonal, branched from the base; branches sub-erect or ascending, reddish below, green and hirsute-hispid or scabrid with whitish hairs above; leaves narrowly lanceolate or sub-linear, gradually somewhat narrowed towards both ends, obtuse and apiculate at the apex, sessile and adnate to the stipules at the base, more or less spreading, rigid, pale-green on both faces, scabrid with short stiff whitish hairs above or glabrous, scabrid more densely beneath or the hairiness limited to the midrib; margins whitish, more or less revolute towards the midrib; lateral veins few, slender, inconspicuous or obsolete; stipules adnate to the leaf-bases and so sheathing, hirsute-hispid at the back or obsoletely so, glabrous and shining inside, truncate, short, with several glabrous subulate or filiform sometimes reddish setæ at the apex; flowers white or slightly purplish, axillary, sessile, $\frac{1}{3}$ to $\frac{3}{5}$ in. long, crowded many together in axillary and terminal sessile subglobose bracteolate heads $\frac{3}{5}$ to $\frac{1}{2}$ in. long; bracteoles subacicular, about equalling the calyx or shorter; calyx about $\frac{1}{4}$ in. long, green; the limb $\frac{1}{5}$ in. long, somewhat hairy outside, glabrous inside, ciliolate, 4-partite; the segments lanceolate-linear, subequal, acute; corolla sub-salvershaped, milk-white or slightly purplish, glabrous except the ciliolate tips of the lobes, $\frac{1}{4}$ to $\frac{1}{3}$ in. long; the tube $\frac{1}{5}$ to $\frac{1}{4}$ in. long; lobes 4, ovate, ciliolate about the apex, valvate in the bud; stamens 4, glabrous; anthers exserted,

oblong, rather shorter than the filaments; filaments inserted between the corolla-lobes; style exserted, about equalling the stamens, puberulous near the apex; stigma hemispherical-capitate, ciliolate; ovary 2-celled; ovules solitary, attached at the middle; disk rather fleshy, glabrous, a little elevated, annular.

Huilla.—In neglected fields near Lopollo, not yet seen in secondary thickets; fl. Jan. 1860. No. **3238**. In moist pastures near Lopollo; fl. 10 Jan. 1860. No. **3239**. In bushy places after clearing for cultivation and afterwards neglected, near Humpata; fl. beginning of April 1860. No. **3230**.

3. **T. ocymoides.**

Spermacoce ocymoides Burm. Fl. Ind. p. 34, t. 13, fig. 1 (1768). *S. ramisparsa* Pohl ex DC., *l.c.*, p. 560; Hiern, *l.c.*, p. 238.

Sierra Leone.—Fl. and fr. Sept. 1853. No. **3248**. On herbaceous declivities amongst low bushes, above Freetown, very abundant; fl. and fr. Sept. 1853. No. **3249**.

4. **T. scabra.**

Diodia scabra Schum. & Thonn. in Dansk. Vidensk. Selskr. iii. p. 96 (1828). *Spermacoce Ruellia* DC. Prodr. iv. p. 554 (1830); Hiern, *l.c.*, p. 238. *Borreria scabra* K. Schum. in Engl. Pfl. Ost-Afr. C. p. 394 (1895).

Sierra Leone.—In hilly, ferruginous-muddy places, among low herbs, above Freetown; fl. Sept. 1853. A small plant with rather narrower corolla than usual. No. **3240**.

Golungo Alto.—In bushy pastures flooded in summer, near Camilungo, rather scarce; fl. and fr. April 1855. No. **3234**. A weak, erect or ascending, annual herb, with white flowers, elongated style, capitate stigma, and 2-celled, 2-valved capsule. In rather poor wooded meadows, near Ponte de Felix Simões; fl. and fr. May 1855. The flowers occasionally were almost bilabiately divided. No. **3235**. A herb, 1 to 1½ ft. high, scattered throughout with white hairs; stem erect, turning purple; flowers white, very fugaceous; calyx investing the ovary, the limb 4-cleft with two opposite lobes almost double the other two in length and breadth. On elevated, sparingly grassy slopes among the mountains of Quilombo-Quiacatubia; fl. middle of April 1855. No. **3241**.

Ambaca.—An annual, divaricately branched herb, with purple, shaggy stem and branches, and white flowers. Among plantations of *Manihot utilissima*, between Halo and Zamba; fl. and fr. Oct. 1856. No. **3237**.

5. **T. arvensis** Hiern sp. n.

An erect, scabrid, hispid-hirsute, annual herb, 4 to 8 in. high, simple or loosely branched; hairs whitish, more or less spreading, thicker towards the base, often arising from a minutely tubercular or scaly base; internodes equalling or shorter than the leaves; leaves narrowly linear-elliptical, narrowed gradually at both ends, acute and apiculate at the apex, sessile, scabrid, hairy on both faces, slightly yellowish-green above, grey-green beneath, 1 to 1½ in. long by ⅛ to ⅙ in. broad, sessile; margin rough, revolute, uni-nerved; stipules shortly adnate to the bases of the leaves, hairy outside, glabrous and shining inside, truncate, with

several longer setæ; flowers $\frac{1}{2}$ in. long, numerous, sessile, crowded in terminal subterminal and axillary dense bracteolate clusters; bracteoles narrowly linear, acute, ciliate, falling short of the calyx-limb; calyx $\frac{1}{6}$ to $\frac{1}{5}$ in. long, somewhat compressed; the tube ciliate when young; the limb $\frac{1}{8}$ in. long, 2-lobed; the segments opposite, pubescent on the back, ciliate, equal linear-lanceolate; corolla-tube very slender, $\frac{3}{8}$ in. long, cylindrical, glabrous; the lobes 4, hairy outside, ciliate near the apex, ovate, $\frac{1}{10}$ in. long, valvate in the bud; the throat glabrous; stamens 4, glabrous, nearly as long as the corolla-lobes, exserted; filaments longer than the oblong anthers; style glabrous, filiform, reaching the anthers; stigma small, capitate, papillose, obscurely bilobed; fruit $\frac{1}{3}$ in. long besides the two persistent calyx-lobes, dicoccous; the cocci dehiscing from the apex.

Pungo Andongo.—In neglected fields of *Phaseolus*, near Muta Lucala and Quisonde, abundant; fl. and fr. March 1857. No. **3236**.

Huilla.—No notes. Fl. Simple, or nearly so, 2 to 6 in. high; flowers rather smaller. Probably a form of this species. No. **3227**.

This species differs from *T. scabra* by its longer slender corolla-tube.

6. **T. aprica** Hiern, sp. n.

An erect or ascending, sub-scabrid, annual herb, 4 to 12 in. high; simple or branched from the base; stem and alternate branches slender, often purplish, scabrid with whitish short hairs above; upper branches few or lax; middle internodes mostly longer than the leaves, the lower and uppermost ones shorter; leaves opposite, linear or nearly so, acute or pointed and apiculate at the apex, slightly or scarcely narrowed, or in the case of the uppermost ones at the base of the inflorescence dilated at the base, sessile, glabrate or scattered with short stiff whitish hairs, rather rough, pale grey-green above, yellowish or purplish green beneath, sub-erect except the uppermost ones at the base of the inflorescence, $\frac{1}{3}$ to $1\frac{2}{3}$ in. long, uni-nerved; the margins cartilaginous, thickened, a little rough; stipules adnate to the bases of the leaves, sheathing, terminating in a few or several more or less prolonged setæ, glabrous and shining inside; flowers about $\frac{1}{4}$ in. long, very numerous, slender, sessile or subsessile, in hemispherical bracteolate terminal heads of $\frac{1}{3}$ in. in diameter with the one or two uppermost pairs of spreading leaves and their stipules forming a kind of involucre; bracteoles filiform, not exceeding the calyx; calyx narrow, compressed, $\frac{3}{16}$ in. long; the tube small, glabrous except some scattered minute scales; the limb bipartite; the segments green, opposite, equal, $\frac{1}{8}$ in. long, narrowly linear-lanceolate, acute, ciliate; corolla white-violet-coloured, salver-shaped; the tube slender, $\frac{3}{16}$ in. long, glabrous; the throat glabrous; the lobes 4, lanceolate, glabrous except a few setæ outside near the tip, $\frac{1}{16}$ in. long, valvate in the bud, spreading in the open flower; stamens 4, exserted; filaments minutely puberulous, inserted at the top of the tube of the corolla between its lobes, longer than the narrowly oblong anthers; disk fleshy, cushion-shaped, glabrous; style filiform, minutely

puberulous, exserted; stigma sub-capitate; ovary 2-celled; ovules solitary.

HUILLA.—In exposed sandy places in the more open forests, near the lake of Ivantâla; fl. end of Feb. 1860. No. **3228**. Differs from *T. arvensis* by its shorter flowers, cartilaginous and thickened leaf-margin.

7. **T. andongensis** Hiern, sp. n.

An erect annual herb, 5 to 20 in. high, simple or dichotomous with sub-erect or ascending branches; stem and branches sub-terete, purplish below, leafy and hirsute with spreading whitish hairs or sub-glabrous above; leaves narrowly linear acute and apiculate at the apex, somewhat narrowed gradually towards the base, sessile, scabrid, rigid, green above, pallid beneath, uni-nerved, 1½ to 3 in. long, erect-patent on the uppermost ones spreading; margin rather thickened, cartilaginous, whitish or scabrid; stipules adnate to the bases of the leaves and so sheathing, hairy outside, glabrous inside, terminating at the truncate apex with several filiform elongated setæ; flowers ¼ in. long, sessile, crowded in sessile terminal and subterminal hemispherical or ovoid bracteolate heads; bracteoles lanceolate-subulate, falling short of the calyx-limb; heads based by approximated pairs of leaves and their sheathing stipules, and thus involucrate; calyx ¼ in. long; the tube short, puberulous; the limb bipartite; the segments equal, lanceolate-subulate, puberulous outside, glabrous inside, ciliate; corolla not exceeding the calyx-limb, funnel-shaped; the tube glabrous; throat naked; the lobes 4, lanceolate, nearly glabrous, about half as long as the tube, valvate in the bud, incurved, apiculate at the apex; stamens 4, glabrous, exserted; style minutely puberulous, exserted; stigma sub-capitate.

PUNGO ANDONGO.—In meadows with short herbage on the right bank of the river Cuanza near Sansamanda; fl. and young fr. April 1857. No. **3242**. In sandy pastures with scanty herbage by the road-side from the præsidium towards Cambumbe; sparingly in fl. April 1857. No. **3243**.

Nearly allied to *T. radiata* (*Borreria radiata* DC.), it differs by smaller flower-heads, only 2 calyx-lobes, etc.

8. **T. lancea** Hiern, sp. n.

A hirsute-scabrid, dichotomous, erect, annual herb, 3 to 9 in. high; stem and branches rather slender, often reddish, more or less scattered with rather long whitish spreading rigid hairs; middle internodes about equalling the leaves, the upper ones shorter; leaves opposite, lance-shaped, sessile, grey-green, scattered with hispid whitish hairs above, uni-nerved, ⅜ to ¾ in. long by ⅛ to ¼ in. broad; the midrib depressed on the upper face of the leaves, raised and scattered with hispid whitish hairs on the lower face; margins cartilaginous, whitish, thickened; stipules adnate to the bases of the leaves, truncate, terminating with elongated filiform setæ, the uppermost ones basing the inflorescence larger, hispid outside, glabrous and shining inside; flowers ⅓ in. long, sessile, crowded in small ovoid bracteolate terminal and subterminal sessile heads, tetramerous; bracteoles

filiform, exceeding the calyx; the heads involucrate with the uppermost leaves and their sheathing stipules; calyx $\frac{1}{8}$ in. long; the tube glabrous over the most part, small; the limb 4-partite; the segments subulate, $\frac{1}{15}$ in. long, ciliate, subequal, corolla whitish-violet-coloured, funnel-shaped-cylindrical, glabrous except some setæ outside the lobes about their tips; the tube $\frac{1}{4}$ in. long; the throat naked; the lobes 4, ovate, $\frac{1}{12}$ in. long, valvate in the bud, spreading in open flower; stamens 4, exserted; filaments minutely puberulous, longer than the anthers; style exserted, minutely puberulous; stigma subcapitate.

Pungo Andongo.—In moist pastures with rather short herbage, near Quibinda, abundant; fl. and young fr. March 1857. No. **3225**. Muta Lucala; fl. March 1857. No. **3226**.

9. **T. dibrachiata.**

Spermacoce dibrachiata Oliv. in Trans. Linn. Soc. xxix. p. 87, t. 52 (1873); Hiern, *l.c.*, p. 239. *Borreria dibrachiata* K. Schum. in Engl. & Prantl, Nat. Pflanzenfam. iv. 4. p. 144. *Pentas involucrata* Baker in Kew Bull. 1895, p. 66.

Pungo Andongo.—An annual, strictly erect herb, with whitish-purplish or sometimes rosy flowers. In moist wooded meadows between Muta Lucala and Quibinda, in company with species of *Scleria*, abundant; fl. March 1857. No. **3231**.

10. **T. thymoidea** Hiern, sp. n.

A somewhat scabrid grey perennial herb with the habit of *Thymus*, 3 to 6 in. high, much branched near the suffruticose base or undergrounnd; rootstock shrubby; stems numerous, cæspitose, erect or ascending, simple above or nearly so, more or less hispid-pubescent with whitish, shaggy or scaly hairs; leaves opposite, decussate, linear or nearly so, pointed at the apex, sessile, minutely scabrid on both faces, grey or yellowish green, $\frac{1}{2}$ to 1 in. long, uni-nerved, sub-erect except those close to the flower-heads; margins white, cartilaginous, thickened; stipule adnate to the bases of the leaves and so sheathing, from the truncate or broad top of the sheath terminating in 1 to 3 bristles or subulate teeth; flowers nearly $\frac{1}{2}$ in. long including the exserted style, sessile, numerous, crowded in sessile terminal heads; bracts foliaceous, forming with the uppermost pairs of leaves a shallow involucre to the heads of flowers and a spreading stellate base to the heads of fruits; calyx $\frac{1}{6}$ in. long; the tube narrower than the limb, compressed, obovate, glabrous for the most part; limb bipartite; the segments opposite, green, equal, linear-lanceolate, ciliate, about $\frac{1}{8}$ in. long; corolla salver-shaped, violet-purple, $\frac{3}{8}$ in. long before expansion, nearly glabrous; lobes ovate, obtuse, valvate in the bud, spreading in the open flower; stamens 4, glabrous; anthers linear-oblong; filaments rather longer than the anthers, inserted at the throat of the corolla between the lobes; style minutely papillose, filiform, shortly exserted; stigma sub-capitate; ovary 2-celled; ovules oblong, solitary, attached about the middle; capsule obovoid, somewhat compressed, $\frac{1}{8}$ in.

long, crowned with one or both of the somewhat accrescent calyx-lobes, 2-celled, 2-seeded; seeds semi-ellipsoidal, furrowed on the inner face.

Huilla.—In pastures amongst low bushes near Lopollo; fl. Jan. 1860. In dry pastures amongst low bushes near Humpata, at the confluence; fr. April 1860. No. **5334**.

This species differs from its allies by its perennial root.

11. **T. verticillata.**

Spermacoce verticillata L. Sp. Pl., edit. 1, p. 102 (1753) maximâ parte. *S. globosa* Schum. & Thonn. in Dansk. Vidensk. Selsk. iii. p. 93 (1828); Hiern, *l.c.*, p. 240; *Borreria Kohautiana* Cham. & Schlecht. in Linnæa iii. p. 311 (1828); Schmidt, Beitr. Fl. Cap. Verd. Ins. p. 210 (1852).

Cape de Verde Islands.—St. Jago, fl. and fr. Jan. 1861. No. **3247**.
Sierra Leone.—Fl. and fr. Sept. 1853. No. **3246**.

47. **GALIUM** L.; Benth. & Hook. f. Gen. Pl. ii. p. 149.

1. **G. productum** Lowe in Trans. Camb. Phil. Soc. iv. p. 29 (1833), and Man. Fl. Madeira i. p. 391 (1868).

Island of Madeira.—At the borders of neglected fields between Funchal and Camara dos Lobos; fl. and fr. August 1853. No. **3250**.

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